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Transverse Fissures in Rails

Excessive Use of Water on Rolls
and Charging Cold Ingots into
Furnaces Too Hot Urged as Causes

—BY GEO. W. DRESS*

AFTER having read several very interesting articles pertaining to transverse fissures in rails, a closer study of the subject prompts me to write concerning several abnormal conditions which quite frequently exist during the manufacture of a rail. Of the transverse fissures investigated, I have

head of the rail. On the other hand, if the rail is segregated and the carbon content is 0.80 per cent or more, we have a brittle rail which breaks suddenly before the transverse fissure has been allowed to progress very far. Track conditions together with excessive punishment due to wheel pres-



Fig. 1—Transverse Fissure in Shattered Rail Caused by Rapid Contraction of Metal. The chemical analysis was: Carbon by combustion, 0.865 per cent; phosphorus, 0.024; sulphur, 0.049; manganese, 0.72.



Fig. 2—Transverse Fissure Developing from Shattered Ingot Caused by a Rapid Expansion of Metal. The chemical analysis of the rail was: Carbon by combustion, 0.834 per cent; phosphorus, 0.019; sulphur, 0.036; manganese, 0.69.

noted two kinds, the initial causes of which may be traced back to abnormal rolling conditions.

The characteristic appearance of transverse fissures in rails which were broken in service is generally that of an oval smooth surface. Under the microscope another characteristic marking is noticed in that the progressive growth of the oval smooth surface is plainly seen. The size and area covered by these smooth surfaces within the cross section of a broken rail are very indefinite. The size depends almost entirely upon the physical strength of that portion of the rail which is normal as to its fracture. If the rail is free from segregation and the carbon content does not exceed 0.70 per cent, then we may expect to find the area covered by a transverse fissure to be unusually large and affecting more than one-half the area of the

sure producing alternating stresses also have an influence upon the area covered by transverse fissures. It is not to be inferred, however, that track conditions and wheel pressure are in any manner responsible for the first cause of transverse fissures.

Accepted Points in Rail Fissure Arguments

There are a number of facts concerning transverse fissures in rails to which metallurgists for the most part agree. Investigations have proved that these fissures occur only in the higher carbon rails; that they occur in rails practically free from impurities and segregation, as well as in rails having an abnormal amount of impurities and segregation; that the grain size, grain structure and micro-constituent adjacent to the fissure are normal with no indication that the metallurgy of the steel or subsequent heat treatment is at fault; that there is no longitudinal depth to the fissure; that a rail

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may have a number of transverse fissures although seldom more than one is found; that the surface of the fissure is smooth and generally oval in shape, and that there are markings which indicate that the fissures are of a progressive nature.

Notwithstanding these facts as a basis on which to form a conclusion, metallurgists have failed to agree as to the first cause of these fissures. It has been argued that friction caused by sliding wheel pressure is responsible for fissures, then again that some abnormal condition in the manufacture of the rail is responsible. Both of the conclusions just cited may have an influence on the progressive nature of the fissures and may perchance be the first cause of a transverse fissure; but there are two other conditions which exist in rolling-mill practices which I claim have a tendency to be the first cause of transverse fissures.

In the rolling of an ingot into blooms and subsequently the blooms into rails, it frequently happens that surface flaws are produced. While the steel is going through the rolls a stream of water is playing on the rolls in order to keep the rolls from getting hot. It has already been said that transverse fissures are usually found in the higher carbon rails and rightly so. By connecting the three sentences in this paragraph and going somewhat into detail we have the following argument for transverse fissures:

The Matter of Excessive Water on Rolls

The higher the carbon content in steel, the more susceptible it is to the transformation of cement carbon into hardening carbon. Now, since a stream of water is playing on the rolls, it is also playing on the steel as it is going through the rolls. If the steel has a surface flaw and the rail is receiving its final passes through the rolls, it is likewise approaching the dangerous critical point or AC_3 temperature on cooling. Now, since a rail in passing through the rolls will be subjected to a stream of water for a moment and if the rail is high in carbon and perchance has a surface defect, it requires but a moment for the water to shatter the rail producing the initial cause of a transverse fissure.

In certain mill practices there are times when a rail at rest prior to its being sawed to length is subjected to water. Here again there is a tendency for a rail to shatter and cause the beginning of a transverse fissure. Recognizing the fact that it is well-nigh impossible to roll rails without applying water to the rolls, yet at the same time it is equally true that the quantity of water used is oftentimes excessive. Fig. 1 shows the fracture of a rail which broke while handling before the rail could be put into service. Unlike the transverse fissures as found in rails after having been in service, the fracture of this rail showed within the fissure a display of colors (an oxidized grain structure) indicating that the rail was shattered while hot. In the absence of the smoothness of the faces in this fracture, we naturally conclude, therefore, that the smoothness of the fissures in rails broken in service is due to the rubbing together of the two faces and that alternating stresses due to wheel pressure is responsible for the rubbing together of the faces prior to fracture.

Charging Cold Ingots into Hot Furnace

Another irregularity wherein the first cause of transverse fissures may be found is as follows: It frequently happens that cold and partly preheated ingots are charged into a hot reheating furnace. The average practical furnaceman, or heater, has experienced that ingots charged in the above manner very often crack with a loud report indicating

that the grain structure is ruptured. Sometimes these shattered ingots break into several pieces, then again they remain intact. The ingots are rolled and it is needless to say that the internal rupture thus produced cannot be welded together by subsequent reheating and rolling, and we naturally have in the finished rail a physical weakness and a defect which gradually progresses when alternating stresses are applied.

The fracture of a rail rolled from a shattered ingot will be that of a transverse fissure having the characteristic oval and smooth surface. In the progressive nature of the fracture which is clearly defined under the microscope, we note that the initial flaw was internal and that the fracture radiated and progressed in every direction. Fig. 2 illustrates a transverse fissure the first cause of which may be traced back to a shattered ingot.

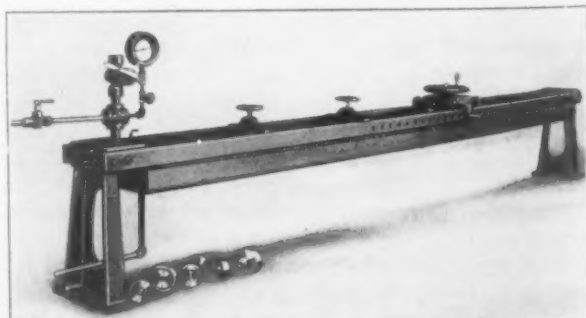
In conclusion a summary of the facts herein stated would define a transverse fissure as a progressive defect in a high carbon rail produced by abnormal conditions, which conditions are the results of rapid expansion and contraction of the metal, thereby causing the metal to shatter.

Machine for Testing Boiler Tubes

A recent addition to the line of hydraulic machinery built by the Watson-Stillman Company, 190 Fulton Street, New York City, is a machine for subjecting boiler and other tubing to an internal hydrostatic pressure test. A number of sizes of the machine are built so that it is adaptable for shops where testing is done only occasionally or for ones having a large output. Either hand or power driven pumps can be used in connection with the machine. The size illustrated is intended for testing boiler tubes up to a maximum outside diameter of $4\frac{1}{4}$ in. with a pressure of 1200 lb. per sq. in. The length of tubes that can be handled by this machine ranges from 5 to 15 ft.

The machine consists essentially of a frame with two rectangular tie bars having a stationary abutment at one end and a moving one at the other. The latter consists of a carriage mounted on rollers that is capable of adjustment to the length of the tube to be tested and then being secured to the side frame by pins, the internal hydraulic pressure being supplied by a pump. A pan under the machine bed catches the waste water and also serves as a reservoir if the tube is initially filled by a pump.

In operation, the tube to be tested is placed in the machine with one end bearing against the fixed abutment. The moving abutment is then brought to bear against the other end of the tube and fastened in place, the tube being made pressure tight by manipulating the handwheel. The tube is then filled from a water main, overhead tank or by a low-pressure pump and after filling a high-pressure hand or power pump is employed to produce the desired test pressure which is indicated on the gage. Two intermediate clamps operated by small handwheels are employed to prevent the tube from buckling while it is subjected to pressure.



An Internal Hydrostatic Pressure Test Is Given Boiler and Other Tubes by This Recently Developed Machine

Treating Brass in a Neutral Atmosphere to Reduce Oxidation

Not long ago, in discussing the corrosive effect of the atmosphere prevailing in certain forms of gas-fired furnaces, an explanation offered was that when metals such as steel containing a small proportion of carbon are heated to a high temperature in the presence of the ordinary products of combustion, carbon dioxide and water, the phenomenon of decarburization begins to assert itself, followed by oxidation. Or, it was pointed out, at the surface of the metal the carbon is eliminated and the virtue of the metal is impaired to a slight depth, while oxidation accounts for the formation of scale.

These effects were the subject of research carried out by Prof. A. E. White, of Michigan University, Ann Arbor, Mich., who found that they could be successfully avoided by the employment of a specially designed furnace in which a neutral atmosphere was maintained. Having solved the problem in connection with steel, Professor White has lately turned his attention to brass. He points out that when brass billets are annealed in a furnace there is invariably some loss in material, due partly to volatilization of the metal in the form of a metallic vapor, and partly to oxidation of the surface, as a volume of the gases surrounding the metal has some considerable influence on volatilization, and the greater the volume the more severe will be the gasification of the metal in a given time.

Previous investigators have shown that volatilization of the surface is theoretically independent of the composition of the gases surrounding it, but Professor White finds that in practice such a statement by no means holds good, for in the oxidizing atmosphere that usually obtains the metallic vapors are converted into oxides, so that when equilibrium is thus destroyed additional quantities of the metal are affected. The only way out of the difficulty is to employ a furnace in which a neutral atmosphere, one having neither reducing nor oxidizing properties, prevails. Furthermore, the alloy must be heated for as brief a period in the smallest volume of gas practically possible.

It may be remembered that for the treatment of steel in a neutral atmosphere Professor White designed a furnace operating on the principle of semi-direct combustion; that is to say, the gas is consumed in two distinct stages with a supply of primary and secondary air. In the first instance a mixture of gas with a small proportion of air is burnt within the muffle, a further quantity of air being added to complete combustion at a later stage around the furnace walls. The primary mixture consists approximately of from two to three parts of air to one part of gas, a mixture which although theoretically incombustible will continue to burn, once the walls of the furnace have attained a sufficient temperature.

The general method employed for dealing with brass is in every respect similar to that used in connection with steel, with the exception that the temperatures involved are not so high. This latter fact was responsible for a somewhat unlooked for difficulty in connection with the ignition of the mixture, and with brasswork it was found necessary to insert a refractory checker work over the gas inlet of the furnace. During the preliminary heating up of the muffle this checker work stores up a certain amount of heat which suffices to ignite the mixture during the subsequent operations.

In the experiments the materials forming the test pieces were rolled into a thin foil, about 0.008 in. thick, and were afterwards formed into a spiral. The spirals were placed in the neutral atmosphere of the furnace for a period of an hour, and when withdrawn they were chilled by being inclosed within a short cast-iron tube. The relatively heavy mass of the cold iron chills the thin spiral so that it can be withdrawn without oxidation. Changes due to the furnace treatment were determined by noting any difference in weight, and also by careful examination of the surface of the foil, the latter enabling the presence of oxidation to be seen.

Summarizing his results, Professor White concludes that a neutral atmosphere has certainly proved advantageous in the treatment of copper and brass. Cop-

per itself is not oxidized when exposed directly to the products yielded from the combustion of coal gas with a restricted air supply, the proportions of air and gas varying with the temperature desired. Up to 1200 deg. Fahr. three volumes of air to one of gas may be used, but for higher temperatures the ratio must be smaller. With commercial copper no appreciable oxidation occurs even when the metal is treated in the furnace for one hour, and the change in weight is negligible. As regards brass, when the alloy consisted of 70 per cent copper and 30 per cent zinc and was heated almost to the melting point for an hour, the elimination of zinc took place to a depth from the surface of only 0.003 in. With lower temperatures even more favorable results were obtained. Professor White clearly shows that the volatilization of zinc from brass is essentially a function of temperature, and that the effect can be considerably lessened by rapid heating in addition to a neutral atmosphere. In this way the loss due to temperature is curtailed, while that due to oxidation is eliminated almost altogether.

Examinations for Technical Government Posts

The United States Civil Service Commission announces competitive examinations open to all male citizens of the United States who meet the requirements for the following positions:

Position	Date	Salary
Subinspector, electrical	May 2	\$3.60 to \$5.04*
Computer	May 2 and 3	\$1.500 to \$1,800†
Junior computer	May 2 and 3	\$1,020†‡
Laboratory assistant	May 2 and 3	\$900 to \$1,200†§
Mechanical draftsman	May 8	\$3.28 to \$4.48*
Metallurgical engineer	May 8	\$3.52 to \$6*
Radio draftsman	May 15	\$7.04*
Electrical assistant	May 15	\$3.04 to \$6*
Assistant inspector of hull (wood) construction	May 16	\$1,200†
Mechanical draftsman	Open	\$4 to \$6*
Assistant inspector of engineering material, air craft	Open	\$1,000 to \$1,400†
Subinspector of construction	Open	\$4.48 to \$5.04*
Architectural draftsman	Open	\$3.28 to \$5.52*
Draftsman	Open	\$3.04 to \$6*
Mechanical engineers	Open	\$2,200 to \$3,600†

*Salary is per diem.

†Salary is per year.

‡For a vacancy in the Bureau of Mines, Pittsburgh.

§For vacancies at Washington and throughout the country.

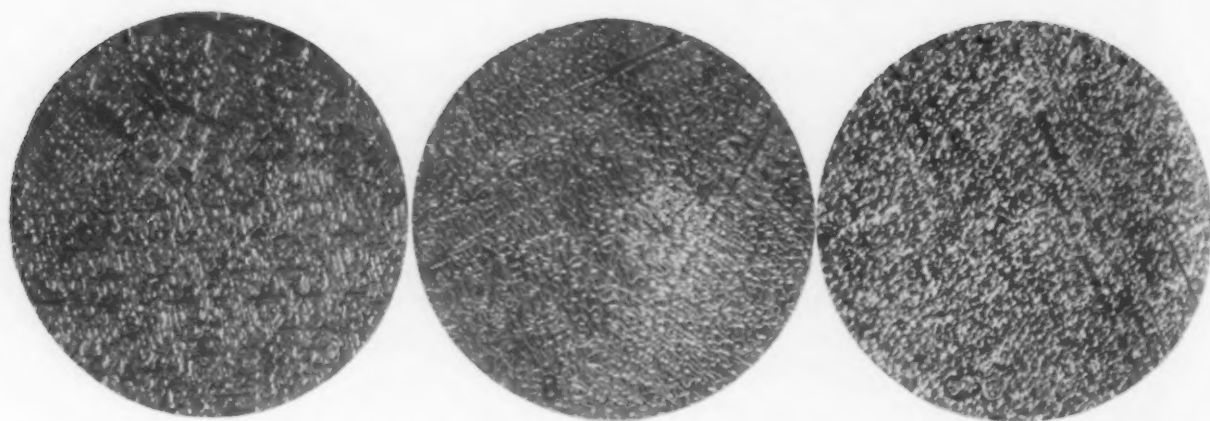
¶For vacancies in the Bureau of Yards and Docks, Navy Department, Washington, and navy yards and naval establishments of the United States.

‡For vacancies in the office of the Chief of Ordnance, War Department, Washington.

In the case of the examinations designated as "open" in the foregoing table, applications will be received at any time and the competitors will not be required to report for examination at any place but will be rated according to the statements made in their applications. Full information regarding the examinations can be obtained from the Civil Service Commission, Washington, or from the secretaries of the various United States Civil Service Boards throughout the country.

Henry Vogt, president Henry Vogt Machine Company; Charles F. Huhlein, president B. F. Avery & Sons Company; W. Hume Logan, president Dow Wire & Iron Works, all of Louisville, Ky., and a number of other Louisville employers have incorporated the Employers' Association of Louisville. It will seek to investigate and adjust differences between employers and employees, will maintain a free employment bureau, and otherwise undertake to serve both its members and their employees. All local industries are eligible to membership.

In order to stimulate the British output of puddled iron a scheme is reported as having been inaugurated which offers inducements to operatives to make practical suggestions for the improvement of present practice. The matter was first raised by the British Board of Education, and it has been passed on by the Ironmasters' Association. Subcommittees have been appointed in various parts of the country to promote the plan.



Photomicrographs of Bronzes A, B and C. They are reduced about one-third from an original magnification of 50 diameters. They were etched in ferric chloride

Bearing Bronzes and the Microscope

Determining the Causes of the Difference in Static Properties of Alloys of Nearly the Same Composition—Lead in Bearing Metals

BY C. H. BIERBAUM AND VERNE SKILLMAN*

THE value of microscopical examination in addition to chemical, physical and mechanical tests on metal alloys is very interestingly shown in the study of the following three bronzes. In this investigation, two of the three bronzes were found to be almost identical in chemical composition. This fact led to the presumptive conclusion that their physical properties were very much alike, if not identical; under tension test, however, it was shown that the one was more than 50 per cent stronger than the other.

There exists here an apparent contradiction, that is, if we grant that a chemical analysis can contradict a static test. On the other hand, an equally unexpected condition existed in two of these bronzes whose principal difference in composition was that one contained 2.5 per cent lead and the other contained none. The conclusion that the one with the lead contents would be the weaker was perfectly natural; the opposite, however, proved to be the case, the one containing lead was 22 per cent stronger than the one containing no lead.

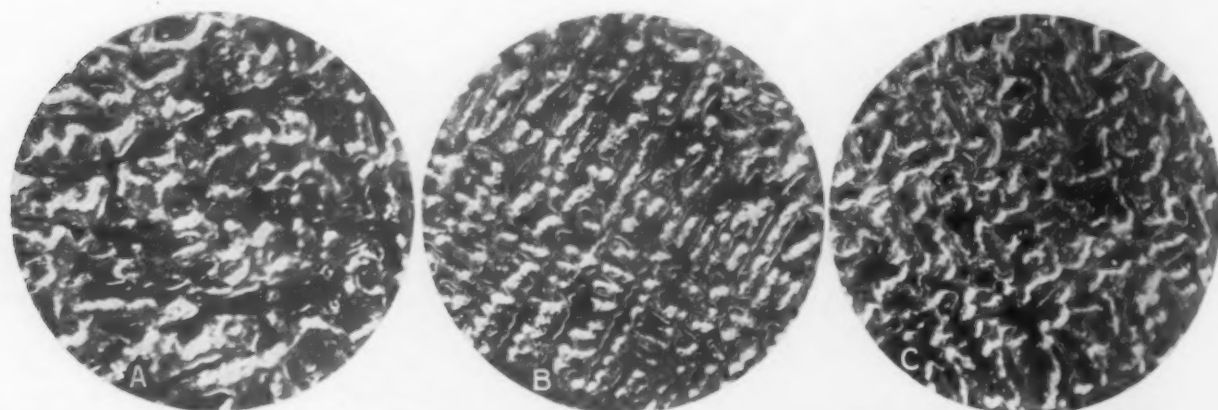
The foregoing apparent anomalies become self-evident and are reduced to consistent facts when investigated by the aid of the microscope in addition

to chemical and physical tests as illustrated by the accompanying photomicrographs.

This investigation was made to determine the relative value of three rather prominent bearing bronzes of to-day. The three bronzes are designated as A, B and C, a widely advertised bronze being represented by A, a section of which was used in this study. This particular piece was a round bar $\frac{3}{4}$ in. in diameter and 12 in. long, cast in sand with the name of the brand upon it and still in the original package when purchased. The other two bronzes, B and C respectively, are Auto Bronze and Machine Bronze, standard composition of the Lumen Bearing Company, a test bar of each being used in this comparative study. They were likewise sand castings, care having been taken to make their size and proportions identical with those of the former piece.

Chemical analysis was made of bronze A, and the results are given in the following tabulation, whereas the bronzes B and C are given by formula according to which they are regularly made up:

	Per Cent Bronze A	Per Cent Bronze B	Per Cent Bronze C
Copper	86.75	86.0	86.0
Tin	10.79	11.0	9.5
Lead .....	.....	0.5	2.5
Zinc	2.40	2.5	2.0



Photomicrographs of Bronzes A, B and C, Reduced About One-Third from an Original Magnification of 200 Diameters. The etching medium was ferric chloride

Standard 2-in. test bars were cut from the three different bronzes and subjected to tension test, giving the following results:

	Bronze A	Bronze B	Bronze C
Elongation, per cent.....	1.5	8.0	6.0
Yield point, lb. per sq. in.....	16,000	17,500	17,000
Tensile strength, lb. per sq. in.	20,500	32,500	25,000

Brinell hardness tests were also made on these three bronzes, using the standard 10 m.m. ball and 500 kg. load. Testing both the hardness of the surface or the outside skin and also the internal hardness on the surfaces of sections of the different pieces, the following are the results:

	A	B	C
Surface or skin.....	86	86	74
Internal	74	74	72
Internal	70	72	65

From each of the three bronzes, sections were cut at right angle to their length. A surface of each was polished and etched in the usual manner, using ferric chloride with a slight addition of nitric acid for etching. This work was done with extreme care, particularly with a view of treating all surfaces alike. In the same manner photomicrographs were made of the different sections showing their characteristic crystallization in terms of both 50 and 200 magnifications. A casual glance at the photographs shows a characteristic difference between those of A and B, showing why B has a greater tensile strength by 12,000 lb. per sq. in. than A. In like manner comparing A and C, one can see why C can contain 2.5 per cent of lead and still be stronger by 4500 lb. per sq. in. than A, and also why C has a higher yield point than A by an amount of 1000 lb. per sq. in. These characteristic differences are all due to the improper metallurgy and defective foundry practice used in the making up of bronze A.

The bearing value of lead in a bronze is well known, also its weakening effect. It has, therefore, always been a matter of compromise in the making of leaded bronzes to sacrifice some strength for the bearing qualities affected by the presence of the lead; therefore, if the strength of a bronze can be increased by scientific and skillful foundry methods, the bearing value of that bronze can be greatly increased by the presence of lead. This to a remarkable degree has been done in the production of bronze C, the presence of the lead enhancing its bearing value greatly and its strength still remaining much in excess of that of bronze A.

To conclude: Bronze B on the one hand represents the strength and physical properties which A should have had, had it been made up under strictly up-to-date foundry practice; on the other hand, the difference in strength between B and C is substantially due to the weakening effect caused by a greater amount of lead in C than in B. This shows that the amount of lead could have been as much as 5 per cent in C, still leaving it as strong as bronze A, all due to proper foundry practice.

Spanish Ore Shipments in 1916

Iron-ore exports from Spain in 1916 were larger than in 1915, despite shipping conditions. The 1916 shipments were 5,148,127 tons, against 4,509,214 tons the year before. Manganese ore exported in 1916 was 6815 tons, as compared with 9136 tons in 1915. Shipments of iron pyrites were 2,743,487 tons in 1916 and 2,268,223 tons in 1915. It is stated that phosphoric iron ores, which before the war went largely to Germany, have been bought in larger amounts by England and France, particularly England. Such mines which closed down after the war started have resumed operations.

Hubbard & Co. Buy Shovel Plants

Hubbard & Co., Pittsburgh, manufacturers of shovels, spades, scoops, railroad track tools and other steel specialties, have purchased the shovel plants of Beall Brothers, Alton, Ill., and the Jackson Shovel & Tool Company, Montpelier, Ind. These two plants will be operated as branch works of the Pittsburgh factory under the former titles of Beall Brothers and the Jackson Shovel & Tool Company. Hubbard & Co. have also purchased the Ohio Shovel & Stamping Company, Canal Dover, Ohio, and the shovel works of the Hussey-Binns Company, Charleroi, Pa. The equipment of these two plants will be moved to the purchasers' other works, largely to the Pittsburgh factory, to increase their capacity. At the Pittsburgh plant new buildings will be erected to be equipped with machinery for making rolled or one-piece shovels.

It is the intention of Hubbard & Co. to have the output of their Pittsburgh plant larger than that of any other single shovel works in the United States, while the total output of their three main works—at Pittsburgh, Montpelier and Alton—will be larger than that of any other firm or company making shovels. The working organization of the Ohio Shovel & Stamping Company and the Hussey-Binns Company will be largely taken care of in the Pittsburgh works, the officials and workmen having been offered positions there. Hubbard & Co. have also acquired the plant of the Beall Tool Works at East Alton, Ill., which is equipped to make railroad track tools, hammers, sledgers and other products.

All the above-named plants have been acquired by Hubbard & Co. in order to take care of their constantly increasing business, both with hardware jobbers and other classes of trade. To that end the finishing and polishing departments in all of their factories have been reorganized and will be equipped to turn out highly finished products. They have contracted heavily for raw material of all kinds, sufficient to run the various plants for close to a year, in an endeavor to anticipate handicaps that may come through difficulties in getting supplies. The officers of Hubbard & Co. are: John W. Hubbard, president; S. A. Rankin, treasurer; Joseph V. Smith, manager of the shovel department; A. F. Zinsmaster, manager of the washer and special stamping department; William H. Remmel, manager of the railroad and tool department; C. P. Seyler and C. L. Peirce, Jr., managers of the electrical materials department.

Poisoning from Blast-Furnace Gas

"Asphyxiation from Blast-Furnace Gas" is the title of Technical Paper 106, by Frederick H. Willcox, Bureau of Mines, Department of the Interior. This report is issued by the Bureau in pursuance of its endeavors to increase safety and efficiency in metallurgical industries. It discusses the nature and causes of poisoning from blast-furnace gas, itemizes the places where gas may be expected to be encountered, suggests safeguards and points out the precautions to be taken in working about gaseous places. Blast-furnace gas is peculiar in that it is very poisonous and under certain conditions, as when it has been cleaned, is without color or odor by which it may be detected. Though the poisoning usually results in nothing more serious than illness and severe headache, it may cause unconsciousness and even death.

German Iron and Steel Shipments from French Districts

Particulars as to the shipments of iron and steel from the French iron districts in German occupation (Briey and Longwy) to Germany and Belgium before and since the war are given as follows in metric tons by the London *Ironmonger* as reported in the *Berliner Börsen Courier*:

	1913. Tons	1914. Tons	1915. Tons
Iron ore to Germany.....	734,012	356,438	41,913
Iron ore to Belgium (including Antwerp)	1,108,152	696,721	112,371
Pig iron to Belgium.....	103,537	38,169	6,064
Steel to Belgium.....	288,288	218,105	4,733

GUIDE FOR ROLLING MILLS

New Form Used at Steelton Blooming Mill of Bethlehem Steel Company

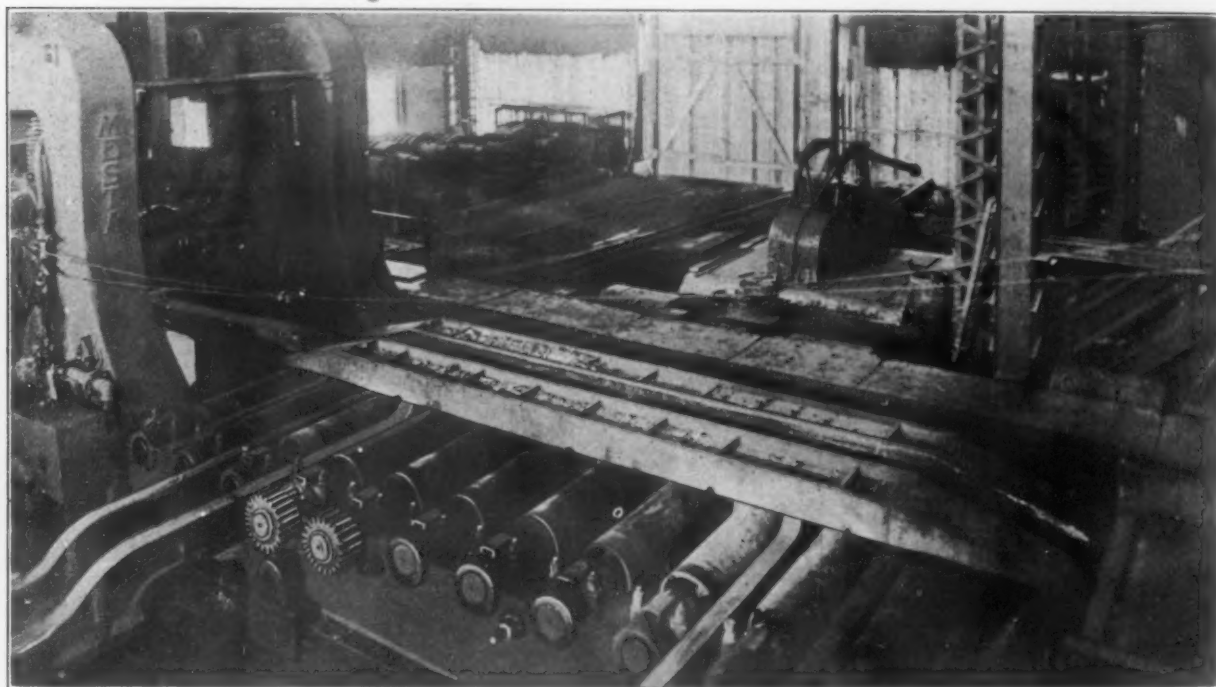
A NEW form of side guards has been in use on the roller tables of the 44-in. blooming mill at the Steelton plant of the Bethlehem Steel Company since February, 1916. They represent guides on which a patent was granted on Feb. 27, 1917, to W. W. Leck, superintendent of the rolling mills of the company at Steelton. The rail and structural mill of which the blooming mill is a part was described in THE IRON AGE of Dec. 16, 1915, but the accompanying illustration is a reproduction of the photograph since the patent side guards were installed.

The feature is the use of what may be called plow shape ends, so that if perchance in the manipulation of the guides they are not brought into correct register with respect to the groove in the roll through which the steel is being passed, the steel will not be forced against an obstruction and resultant damage ensue. Instead, if the steel should be delivered by the rolls against one of the guides, it simply rides on the slop-

It may be noted that the ends of the bars are provided with terminal lips at the end of the tapered portion, which lips fit down over one of the feed rollers. By this construction the guides are provided with a skid portion over which the ingot will ride without interference in the event of an accidental lack of registry and the retaining lips restrain the guide against a longitudinal movement. The patent also covers the shaping of the underside of the guides to fit the rollers closely.

Use of Strainer in Pouring Iron Molds

When metal to be used for rolling mill work is being poured into an iron mold care must be taken, according to the Waterbury Book of Alloys, published by R. A. Wood, Cheshire, Conn., to have the stream drop into the mold as nearly straight as possible. If the stream strikes the side of the mold the casting generally has a rough or pitted surface at that particular point, this being particularly true with alloys that are rich in copper and sterling silver. High-copper alloys which contain tin and phosphorus will burn away some of the iron if allowed to strike the side of the mold and damage it, as well as causing the alloy to become con-



If a side guard should happen not to register properly with the rolls, the bloom will ride on the tapered end and thus avoid breakage and resultant delay

ing end of the guide, and no breakage results. In the photograph a timber is shown resting on the bottom roll and touching the guide at the same elevation as would be the case with a misdirected bloom.

Steel rolled on two-high blooming mills is deflected from the straight line of passage, back and forth, through the rolls for various reasons, such as a cold side, sidewise pressure on the bloom entering the rolls, pieces entering the pass too small from the preceding pass and from cobbles and bad ends. Breakage is sometimes caused in addition by the failure of the manipulated guards to respond to the operator controlling the levers, and also due to negligent operators. Damage, of course, as well causes a delay.

An important item is that the sidewise travel of the machinery may be reduced 40 per cent by being able to keep the side guards in close connection with the steel at all times, while with the ordinary blunt end the guard must be returned to the rest position or far enough away to keep it from getting struck with the bloom. The Trumbull Steel Company, Warren, Ohio, has, it is understood, arranged to put in a set of these guards on its 34-in. blooming mill now being built by the United Engineering & Foundry Company, Pittsburgh.

taminated with the iron burnt from the mold. Defects of this nature in a cast bar, it is pointed out, are very likely to develop into cracks when the metal is rolled.

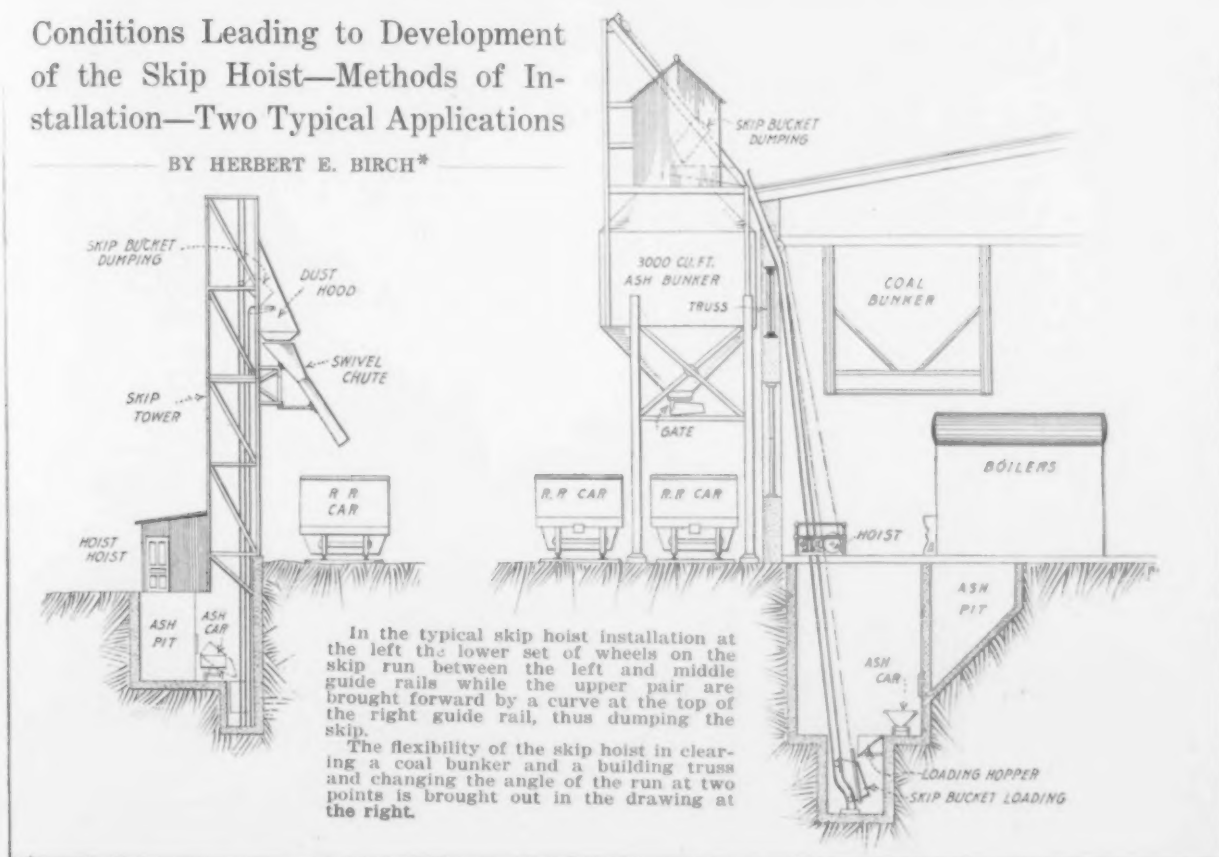
Pouring may be done by the use of a strainer or basin before the metal enters the mold. The basin is a V-shaped receptacle containing one or more holes of $\frac{1}{4}$ to $\frac{3}{8}$ in. in diameter through which the metal runs. It is fitted to the top of the mold so that it centers the streams of metal and causes them to drop into the mold without striking the edges. Hinges may be employed to fit the basin to the back of the mold so that as soon as the pouring ceases the basin may be thrown back and emptied of any dross or charcoal that it may contain. If the holes are too large, the metal will enter the mold too rapidly and cause a defective casting, while if they are cone-shaped or not in the right direction the streams of metal will flare as they leave the basin, thus nullifying any benefit that may be derived from its use.

A coating of oil and black lead should be given the basin before the metal is poured into it, and in the case of alloys containing phosphorus or those which require pouring at a high heat, the basin may be given a coat of clay. All of the moisture should be expelled from this coating before any metal is poured into the basin or an explosion is likely to occur.

Handling Ashes at Steel Plants

Conditions Leading to Development of the Skip Hoist—Methods of Installation—Two Typical Applications

BY HERBERT E. BIRCH*



In the typical skip hoist installation at the left the lower set of wheels on the skip run between the left and middle guide rails while the upper pair are brought forward by a curve at the top of the right guide rail, thus dumping the skip.

The flexibility of the skip hoist in clearing a coal bunker and a building truss and changing the angle of the run at two points is brought out in the drawing at the right.

THE handling of ashes is a problem of large proportions, especially where forced draft stokers are used and operated in excess of nominal rating. In general, three methods have been advocated to dispose of this boiler house product, the car and skip hoist system, the chain conveyor and elevator method and the suction system. The purpose of this article is to describe a few applications of the first-mentioned system at steel mill boiler houses and enumerate the reasons responsible for its selection.

The skip hoist consists essentially of a steel bucket running on inclined or vertical tracks and hoisted by a steel cable attached to an automatic winding drum, which is usually directly connected to an electric motor, although pneumatic, steam or hydraulic power may be applied to the drum in various ways. The ash skip hoist is not the product of a factory confronted with the problem of finding an outlet for their foundry, nor is it the exploitation of a patented idea. Rather, it is really the poor downtrodden users' own solution of the serious problem of ash disposal. Some years ago, when a large Eastern city electrified its horse-car lines, a number of power houses were built and equipped with all the up-to-date devices then known, among which was complete coal and ash handling equipment. The builders of this machinery attempted to use coal conveyors to remove the ashes from the boilers and deliver them to an overhead bunker. Of course, the equipment lasted only a few short months, for no one had attempted to handle ashes mechanically previous to that. The plant operators were forced to solve their own problem and gave consideration to the following points: 1. The

machinery must not be affected by grit, heat or water to any great extent. 2. The capacity must be high, for it was, even then, apparent that the size of the power houses would increase rapidly in a very few years. 3. It must be capable of lifting the ashes to a great height. 4. The operating cost must be low. 5. The cost of the equipment must not be prohibitive. 6. It must be free from the serious breakdowns which the present systems were subject to and must have a low repair cost.

The Development of the Skip Hoist

These points, and possibly many others, were carefully examined and all the known devices scrutinized, but these were found wanting, if not in one feature, in another. Finally, the skip hoist was conceived and tried out in service. It stood up so well and its fame spread so rapidly among sorely tried plant operators, that it was adopted by practically all large Eastern power houses, including many railroad systems, in one form or another. That is, the ashes were put in a tub and hoisted to the storage bunker. It was stated and proved that the ashes, once in the bucket, were dormant with relation to the bucket, the only wear occurring when the bucket discharged its load.

The original winding machine was an ordinary belted freight elevator hoist with crossed belts and tight and loose pulleys. The present day direct-connected machine was unknown in the early days of the skip hoist, but even now the principle remains the same, the improvements being in refinements of detail and in the controlling equipment, which is entirely automatic so that no dependence whatever is placed on the operator.

Let us examine the salient features mentioned as being necessary to the successful operation of ash-

*Mechanical engineer, R. H. Beaumont Company, Philadelphia, Pa.

handling equipment 20 years ago, and let us further remember that ashes are to-day, the same as then, a gritty, abrasive material that is either dripping wet or red hot. The first has already been touched upon. Aside from the bucket, there are no parts that come into contact with the ashes, and the bucket, being merely a steel box with a few wheels, can easily be replaced after 6 to 10 years' service, for a very small amount. The hoisting rope and head sheaves are subject to no more wear than an ordinary freight elevator neither are the steel tracks. Heat and water have little effect on the bucket as there are no wearing parts to get out of gear through distortion by heat and no chain joints, etc., to wear out. The only piece of machinery which was subject to the action of the ash grit was the winding machine, and this was placed away from the equipment and the rope led to it.

As to high capacity, it is apparent that the size of the skip bucket can be made anything desired, within reasonable limits, and two buckets could be run together, one going up and the other coming down on separate tracks and balancing each other.

It is also easy to see that the height to which the ashes are elevated does not affect the equipment further than that it takes the bucket longer to complete the cycle, unless the hoisting speed is increased, and this means merely a larger motor. All other considerations do not affect this feature, for it is just as easy to hoist the bucket 140 ft. as 40 ft., simply more rope is required and a wider drum.

Operating cost is a graver consideration than is usually imagined. First, a man is required in any system, either to hoe the ashes into a pipe or to rake them into a conveyor. It was said, why not let him push a small car, as he must be paid in any event. If the capacity is increased, give him an electric hopper car. In large plants the ash cars are run in trains and are hauled by a small electric locomotive. Power consumption is where the saving is effected, for the big feature that was recognized, years ago, was that the skip consumed power only when actually hoisting the load. It did not have to run idle even for an instant. The power it consumed was very small, something like 5 hp., for an equipment to handle 8 tons per hr. The prevailing systems frequently ran empty or only partly loaded and frictional losses were very high.

Cost of equipment was considered very carefully but viewed from any angle, the skip seemed more economical than anything else. A bucket, a piece of rope, a winding machine and the tracks constituted the equipment. The receiving bunker could be as simple or elaborate as desired, and, of course, was necessary in any system.

Breakdowns were dismissed as remote possibilities, for the skip was practically a form of freight elevator, the reliability of which was well known. It was also conceded that the few parts subject to wear, such as the bucket and ash car, could be repaired by the local forces, as there was nothing mysterious about a tub having wheels. The wire rope was easily open to inspection, as was all of the equipment, and, therefore, plenty of warning was given when any part needed attention.

It certainly is not to the credit of the conveyor houses that they failed in the solution of the ash-handling problem, but this was probably due to their intense desire to sell something they made in their own foundry and, therefore, it fell to the lot of contracting engineers engaged in the conveyor business to father the skip. There is nothing mysterious about it. The skip bucket, when ascending, is guided by three wheels and three rails on each side.

The bottom pair of wheels are restrained in a purely vertical path, while the upper pairs are forced by their guides to follow a vertical path until the dumping point is reached, when they run forward and come to a stop before the bottom pair have reached their maximum height and this action tips the skip bucket, thus effecting the discharge as shown by the dotted lines. A traveling nut, actuated by a worm shaft attached to the drum, now engages the switch wheel and throws it into the reverse position, when the bucket will descend and come to rest in the pit. Means are applied to secure this bottom stop, otherwise the hoist would be pumping up and down continually. In fact, this idea has been applied in connection with large balanced skip installations, where automatic measuring loaders are employed to fill the buckets. The motors used are standard elevator types, with high-resistance end rings, and are thrown on the line without the use of external resistance.

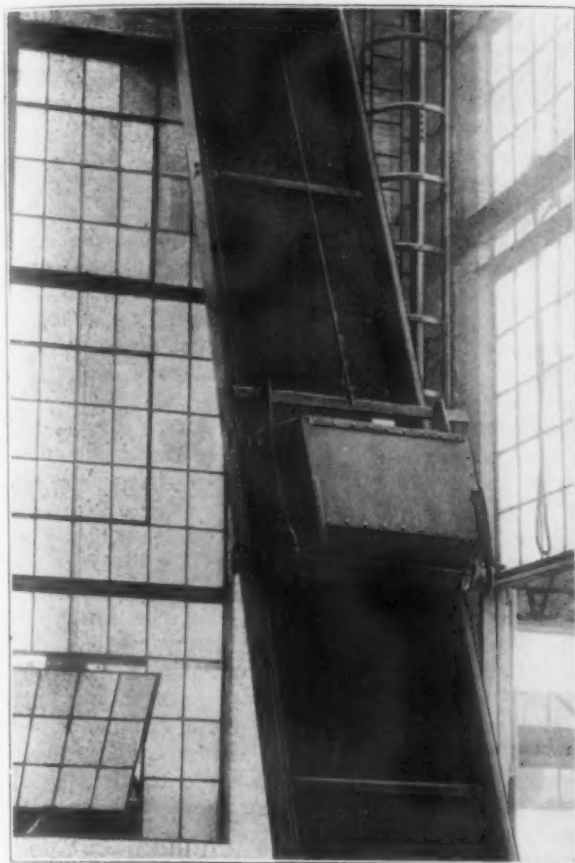
Handling Clinkers and Other Refuse

With the advent of the modern forced-draft stoker and the consequent high overloads, the ash skip hoist was called upon to prove that its advocates had not been mistaken. Very large and hard clinkers were turned out of the stoker pits and herculean effort was required to break them at plants where the skip, like many other pioneer devices, had not been accepted. The only change necessary at plants having the skip hoist was that the bunker gates had to be made larger to discharge the large clinkers which the skip easily handled. This latter feature was the cause of a new era in the life of the skip, for many plants were changed over for this reason alone that would probably have limped along in some way on their old equipment rather than admit their original mistake, which, perhaps, was the fault of their builders rather than that of the operators.

A few other factors which had much to do with the popularity of the skip were its ability to handle soot, flue dust, firebrick and any type of boiler room refuse and the wonderful feature that the operator was practically free from dependence on the factory for repair parts and their consequent fancy prices.

Before describing a few typical installations, a word of caution may not be out of place regarding ash bunkers, which certainly is of interest to steel mills. A steel plate bunker, having a conical bottom and a circular body similar to a water tank, is far better than one of concrete. This type of bunker is the only one from which the ashes will discharge easily. Concrete is too rough and the ashes clog at the discharge opening. The steel plate bottom should be made heavier than the circular body to resist abrasion. The writer knows of one concrete bunker which was torn out for this very reason after being in service for only six months.

The skip hoist bucket at the Worth Brothers plant of the Midvale Steel Company, Coatesville, Pa., ascends an inclined track and discharges into a bunker over the railroad tracks outside of the boiler house. The bunker, which holds 3000 cu. ft. of ashes, is made of steel plates $\frac{3}{8}$ in. on the sides and $\frac{1}{2}$ in. on the bottom. It is supported by rolled H-columns securely braced and designed according to the American Bridge specifications. The bunker is fitted with a 24 x 24-in. cast-iron duplex undercut gate, which is arranged with levers and hand ropes for operation from the ground. The space between the skip tracks is covered with No. 12 sheets to protect the workmen from the possibility of falling clinkers. A safety ladder in the corner of the build-



The Underside of the Skip Hoist Track Is Covered with Sheet Steel to Protect the Workmen from Falling Ashes and a Ladder Gives Access to the Overhead Sheaves



At the Worth Brothers Plant of the Midvale Steel Company the Ashes Are Collected in an Elevated Bunker Outside the Boiler House

ing gives access to the head sheaves for inspection and lubrication, a platform being provided inside the head house to enable the workmen to perform these necessary duties.

At the Nicetown plant of the Midvale Company a duplicate of this outfit is working, the only difference being that it is operated by a push button, while the Coatesville skip is started by the man pulling a rope. The layout is shown in one of the drawings, and attention is called to the difficult situation which existed here. The railroad tracks were very close together and the existing coal bunker and a truss between the building columns, both of which had to be cleared, provide an excellent illustration of the versatility of the skip hoist. The tracks can be on practically any angle between about 35 deg. and the vertical and can change direction very easily, although there are certain features in making a change of direction which necessitates an intimate knowledge of the device.

A vastly different installation is at the Republic Iron & Steel Company, Youngstown, Ohio, where a vertical skip discharges directly into a railroad car. A swivel chute is used to direct the flow of ashes into the car which enables the operator to fill quite a large portion of the car without shifting it. This swivel arrangement also permits of the maintenance of the standard railroad clearance when the apparatus is not in use, as it can be swung completely outside of the prescribed space which must be kept free from permanent obstructions.

In all of these plants collection of ashes is made by a small push car, which is equipped with dust-proof roller bearing wheels of large diameter and operates on standard industrial tracks.

One more point may be of interest to power plant designers and that is to make the ash pits under

the stokers large enough to take care of the night ash so that all the ashes produced in 24 hr. can be handled in one shift.

German Methods of Producing Sulphuric Acid

The production of sulphuric acid or sulphuric anhydride in Germany from plaster of Paris in an electric furnace is vouched for by the eminent French chemist, M. Cazeneuve. It is also stated that the Germans are carrying on a process of treating plaster of Paris with sand, producing silicate of lime and cement at the same time as sulphurous acid. Since the war Germany has had to look about for sulphur with which to make sulphuric acid, which partly explains the new process. Before the war Germany imported each year about 900,000 tons of iron pyrites from Spain for making sulphuric acid, about 300,000 tons being mined in Germany. In 1912 and 1913 it is stated that 1,200,000 tons was imported each year from Spain. Besides these imports about 400,000 tons per year came from Norway, but this supply is not now available. Small quantities are probably now obtainable from Poland, Greece and Turkey.

The Texas Steel Company, Beaumont, Tex., will commence in the present month the building of a railroad connection to extend tracks into its plant. The company does not expect to accomplish much in May, but beginning June 1 plans continuous work upon construction with the prospect of completion of the plant within 9 or 10 months from the date of actual laying of the foundation.

The New Britain Machine Company, New Britain, Conn., has opened an office at 46 Garfield Building, 870 Woodward Avenue, Detroit. The company manufactures multiple spindle screw machines, multiple spindle chucking machines, polishing machinery, shop furniture and pressed metal work. Thomas C. Stirling is district manager in charge of service and sales.



AUTOGENOUS WELDING SCHOOL

Chicago Institute Gives Instruction in Oxy-Acetylene Work in All Metals

ALTHOUGH the demand for operators skilled in autogenous welding is widespread, and is steadily growing with the development of the process and as its application expands, men who are proficient in the art are none too plentiful. In fact, it may be said that there is a dearth of good all-round workmen. So thoroughly convinced is the management of the Imperial Brass Mfg. Company, Chicago, of the future need and opportunity for experts in the manipulation of oxy-acetylene welding and cutting apparatus that it has established a practical training school, known as the Chicago Welding Institute.

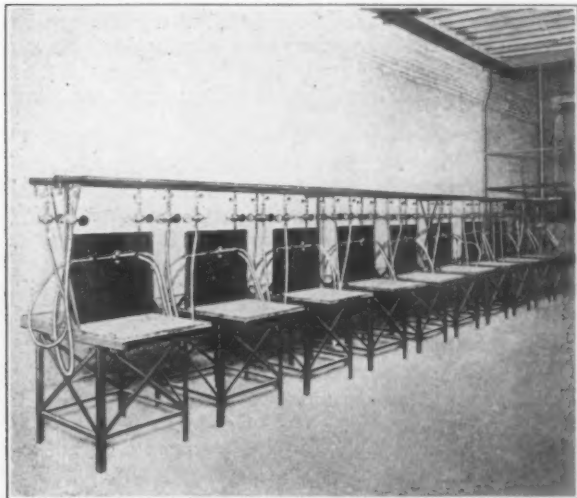
The school is housed in a one-story brick structure, 50 x 125 ft., in Racine Avenue, near Harrison Street, and will be managed by Foster F. Hillix, formerly an instructor in shop and foundry practice at Stout Institute, Menominee, Wis., and at Purdue University. The fees to be charged will vary with the extent and character of the course which the student undertakes, and takes into consideration the expensive materials used in practical class work. The building has been so constructed that a second story can be added when the need arises.

The equipment of the school consists in part of 20 benches for as many students, equipped with oxy-acetylene outfits, whereon a class can do actual work with the welding torch. In addition to the large shop wherein actual work is done, there are class rooms for instruction in the theory of autogenous welding, in which lectures are given bearing

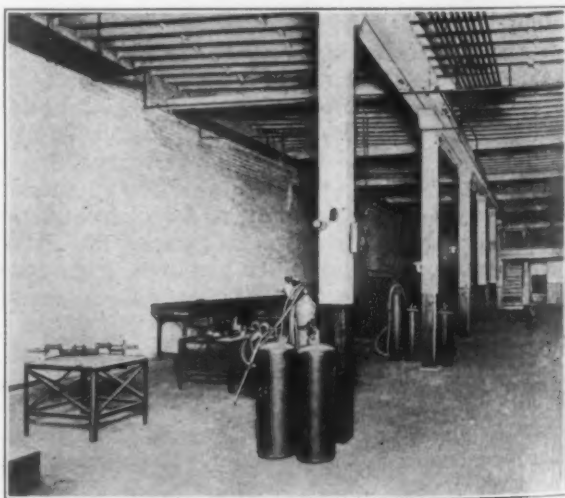
on the theoretical side of the practical work that is to follow. A textbook has been especially prepared for the school, and study of the book is carried along with the shop training. With regard to the latter a course of exercises has been arranged so that the student obtains sufficient drill to enable him to accomplish successfully the more difficult work that comes near the end of his course. In addition to the exercises referred to, it is planned to have a varied assortment of practical work in progress in the shop at all times, this work, of course, coming from outside. Due attention will be given to the time which a student consumes in his exercises and in his practical work, and the standards of time in which a stated operation must be completed will be as exacting as exist under manufacturing conditions. By practice the student is expected to develop adequate speed in the performance of all operations.

The school offers a number of courses. There is a complete one for those who would undertake to acquire a knowledge of welding in all its branches, and also gain experience in the various kinds of work. For those who do not desire, or possibly do not need, the full course of instruction, a modified one has been arranged. For instance, a student may take up aluminum welding alone, or steel welding. Again, a man may wish to conduct a job repair shop, specializing in automobile repairing, or he may wish to qualify for a manufacturing position, or to fit himself to repair farm machinery. The complete course takes up the welding of all metals, the time required being about 12 weeks. A moderate fee is paid by the student for this instruction and covers all expenses, including textbooks, goggles, supplies, etc. The shorter course requires but a month or less. The plan of the school is to have three classes a day, and probably one at night, thereby giving an ambitious mechanic, garage owner, etc., an opportunity to acquire knowledge and skill which will better his condition. Certificates denoting proficiency in the art of oxy-acetylene welding are given after rigid examinations have been passed.

The plan of the enterprise is to have the students at work in a school, yet in the atmosphere of the modern shop, an end which is achieved by their being in a position to observe the actual performance of custom work by experts, and to participate in that work when they acquire the necessary ability. The Government has called for men proficient in the art of autogenous welding, and it is not at all



Benches Equipped with Oxy-Acetylene Welding and Cutting Outfits for Twenty Students in the Newly Launched Chicago Welding School

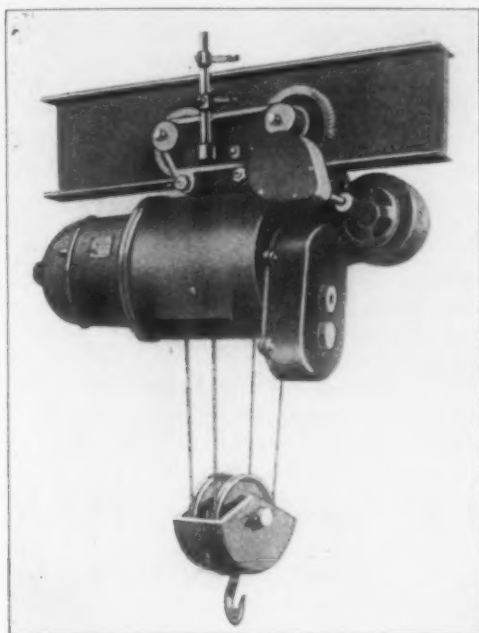


Students Are Given Practical Instruction in a Shop, Mastering a Series of Exercises, but Observing the Execution of Custom Work

improbable that the new school may prove of direct assistance in the present stress of international relations.

New Line of Inclosed Electric Hoists

A new line of an inclosed type of electric hoist has been brought out by the Barber-Foster Engineering Company, 605 Swetland Building, Cleveland. Spur gearing with cut teeth is used in this hoist, the gears and pinions being turned from solid steel blanks. After the teeth are cut they are heat-treated and hardened. Thus all forms of bevel, internal worm and other spe-



This Remote-Control Motor-Driven Hoist Is Designed for Use as the Hoisting Unit on Traveling, Jib or Wall Cranes. While the Addition of an Operator's Cab Adapts It for High-Speed Intercommunicating Systems

cial gearing, it is emphasized, are eliminated. The shafting is hardened and ground at the bearings. Hyatt roller bearings are used, and on account of the slow movement, the drum bearings are bronze-bushed. It is built for heavy duty, and it is pointed out that because of the inclosed design, the hoist is well adapted for outdoor service or where exposed to dust, dirt or acid fumes.

The frame is of cast iron, cylindrical in form, and constructed to support and inclose the working parts, including the drum and brakes. A narrow slot in the drum section, through which the rope passes, is the only opening in the frame. The portion of the frame containing the gearing and mechanical brake is separated from the drum by a cast partition and is packed with transmission grease. The hoist has a large-diameter cast-iron drum, machined and grooved to receive the full amount of rope for the given lift without overlapping, the diameter of the drum being 30 times that of the plow steel hoisting rope. The drum gear is keyed to the end of the drum and not to its shaft.

A mechanical load brake of the friction disk type, which automatically stops and holds the load when the motor is stopped and is released only by starting the motor in the lowering direction, is provided. It is stated that while there is little need for special lubrication because of the use of roller bearings and gears running in transmission grease, provision, however, is made for lubricating the bearings with oil. The load block consists of a cast frame containing sheaves of large diameter with bronze bearings. The hook is a drop forging that swivels on ball bearings. The trolley consists of two castings connected to lugs on the frame by through bolts. By removing these bolts, the hoist is detached and each trolley frame with the wheels is readily removed from the I-beam. The wheels are single flanged with tapered tread and have roller bearings.

The hoist can be supplied in $\frac{1}{4}$ to 2 ton sizes for use with a plain trolley; in a geared trolley style with hand chain for operation for loads of 2 to 10 tons, and in 2 to 10 ton capacities with a motor-driven trolley. The last type can be used as the hoisting unit on traveling, jib and wall cranes and when equipped with an operator's cab, is used as the hauling unit for a monorail system.

The Barber-Foster Engineering Company was recently organized with W. A. Barber as president and W. B. Foster as secretary and treasurer.

A St. Louis Scrap Problem

Old material dealers in the St. Louis market have been considerably exercised by an order from the Interstate Commerce Commission that gondola equipment shall be used only for coal, coke and pig iron, and the majority of the concerns doing business in that market have telegraphed protests to the commission, reciting that steel and iron scrap in their section is used by industries which cannot unload from box cars, inasmuch as they use locomotive and overhead cranes therefor, with magnet equipment, and are thus handicapped severely by the order. It is also recited that even if the labor supply was sufficient in that territory for unloading from box cars—which it is not—approximately double the usual time would be required for unloading from box car equipment, thus holding the equipment a sufficient amount of extra time to nullify the purpose of the order, at least so far as it relates to scrap material. It is urged that steel and iron scrap, in the present state of the market, particularly as to supply, is as vitally important to the plants as is coal or pig iron, and that therefore gondola car facilities should not be withheld from the old material interests.

The World's Aluminum Output

The present capacity of the various aluminum producing countries of the world, taking into account the new works under construction, according to an article in *L'Echo des Mines* of Paris, is as follows:

	Tons
United States and Canada.....	75,000
France	20,000
Switzerland	20,000
United Kingdom	12,000
Norway	16,000
Italy	7,000
Total	150,000

The consumption of the United States in 1915 is stated as 50,000 tons against 40,000 tons in 1914. The writer believes that the aluminum industry is certainly preparing to play a very active part after the war, not only in construction of automobiles and aeroplanes, but in other industries. A large field is the use of various aluminum alloys. A great future is predicted for the metal as a competitor of copper and even of tin plates.

The Poole Engineering & Machine Company, Baltimore, has acquired, through consolidation, the exclusive manufacturing and selling rights of the turbo-gear manufactured by the Turbo-Gear Company, Inc., also of Baltimore. This is a device which, through long and severe service, has proved its great value for use with high-speed electric motors, steam turbines and other prime movers or driving machines that require a different speed for the driven unit. A descriptive catalog has been issued by the company.

The cost of a patent is discussed in a circular issued by George Hillard Benjamin, 66 Broadway, New York. The cost in terms of the kind of patent, the nature of the invention and the work required in the patent office are all covered. The cost of trademarks, copyrights and litigation is also touched on and tables are given on the cost of foreign patent rights, foreign design patents and foreign trademarks.

Labor Scarcer and Products Tend Higher

Manufacturers' Views on the Situation Created by Going to War — Industrial Workers and Enlistment — Developments at Washington

In response to inquiry by THE IRON AGE a number of manufacturers who have had munitions contracts express themselves below on the labor situation created on the one hand by the running out of a number of foreign contracts for munitions and on the other hand by the letting of Government work and by the enlistment of many men employed in metal working industries. The testimony is all one way—namely, that the men released by the termination of munitions contracts with the Allies have all been absorbed in other industries, leaving the labor situation as tight as it has been at any time.

To add to the difficulties, large Government contracts are coming forward both in metal working and other lines, and there is looming up further depletion of industry by the volunteering of workers for service in the army.

Prominent steel manufacturers have written to the Secretary of War saying that the patriotic impulse will lead many men employed at iron and steel works to enlist, but as they are now important parts of the war machine, they should be urged to stay at their posts, and meantime there should be legislation giving them an honorable status in the Government service.

The chief development at Washington in the past week has been the announcement that Charleston, W. Va., had been selected as the city in which the Government armor plate plant will be built. Five open-hearth furnaces are to be built at the start and pig iron will be bought.

Munitions Makers Discuss Labor and Materials

Completion of Foreign Shell Contracts Has No Effect on Labor Situation

The president of one of the largest companies that has been prominent in munitions work for Europe says:

"As to the future of the labor situation, our views are not very clear and we are seeking for facts rather than drawing conclusions. Munitions contracts for foreign governments are being completed and are not being renewed. The workers released are being absorbed by other lines of industry. The demand for labor is so great that the completion of war contracts has no effect upon the labor situation. When the United States begins to place large contracts for war material, which must be very soon, these workers will be drawn back into that special work. The placing of contracts by the Government in the near future, which in the aggregate must be enormous, will add to the present difficulties of the labor situation. The factors affecting it may be summarized as follows:

"Owing to the prosperity of the past two years, the demand for ordinary manufacturing products is excessive and necessitates employing the maximum operating force. Agriculture demands an excessive number of workers to supply the great need for foodstuffs for home and foreign consumption.

"There will be an added demand for workers on war materials of all kinds. There will be a withdrawal of men for active service in the war, including the army, navy, home defense, Red Cross and the non-combatant auxiliaries of the war forces.

"The labor supply of the country is virtually further reduced by the recognition of the nominal working day of eight hours for railroad workers. This has stimulated demands for a shorter working day from many unorganized trades.

"The war has caused a complete suspension of immigration from over-sea countries. When this enforced suspension of immigration is no longer effective, there will remain the artificial restriction of immigration by national legislation which has been enacted

at the instance of the labor unions assisted by well-meaning theorists.

"There has been some reduction of efficiency caused by excessive prosperity.

"These causes point to probable further constant advances both in the cost of living and in wages, the two forming a vicious circle or endless chain which will continue to operate so long as the demand for labor and commodities exceeds the supply. There is no indication yet of the labor supply having caught up with the demand, either in the metal trades or in general lines of industry. The only sources from which relief can be obtained are in the wider employment of women in the industries, and in a general utilization of the cheap negro labor of the South. Eventually it would seem as though the demand might become great enough to bring about a relaxation of the immigration laws."

Some Losses Among Machinists

A Connecticut manufacturer of special machinery already has had some losses from enlistment:

"This company is not employed in any sense in the making of munitions; but it is a fact that in both our manufacturing plant, where we are making metal specialties, and in our machine shop, where we are building special machinery, a great percentage of this work is of indirect value to the country in war time. At the present time we could use perhaps 30 to 50 machinists in addition to those employed; and our observation is that the labor situation is becoming worse rather than better, and we feel that every man who leaves our plant decreases our production permanently; in other words, we are unable to replace any men who leave us.

"There have been scattered remarks and articles about the fact that the Government would prevent the enlistment of first-class machinists. Up to the present writing we have seen nothing definite in this regard, but on the other hand have lost quite a few men

who have enlisted in the militia. It seems to the writer that there are thousands of men employed in mechanical trades who are undecided as to what steps they ought to take in regard to enlisting, and that any definite advice from the Federal Government should not be delayed unnecessarily.

"To condense our feeling, as expressed above, a brass band appearing in the street at any moment is very liable to affect seriously the shortage of skilled mechanics, which is already a grave problem."

The Question of Regulating Steel Prices

The company making the following expression and a company co-operating with it had an important contract for large shells which has now been completed:

"We have finished our contract for 8-in. shells for the British Government, releasing in all between 6000 and 7000 men, including the employees of the company which did the finishing of the shells. We are figuring on some work for our Government, which, however, so far promises to be rather small in volume and will take up only a small number of the men originally employed on this munitions work. Of course, it is possible that if a large credit is arranged for the Allies they may again come into this market for shells.

"No doubt the first army of 500,000 men will come from the younger men from schools and colleges, and from clerical and similar occupations. The steel business generally, I think, will not be seriously affected. This industry uses a great many foreigners, and I think very few of them will enlist. We do not look for any serious disturbance at our plants on account of recruiting the army. A vitally important thing is keeping enough men on the farms to maintain and increase the food supply. Some form of State or Federal regulation may be necessary to accomplish this.

"If the newspaper reports are correct, there is already some evidence of the Government regulating steel prices. This may not be a bad thing. Prices at the present time are very abnormal and profits are excessive, inviting a serious drop, with possible panic features, at the expiration of the war. If by Government regulation the prices at this time are brought down to a more reasonable basis, there will not be the danger of serious collapse later. It seems to us, however, that if the Government is going to regulate the prices of finished steel, it will have to get back to the raw materials, as the steel manufacturers who are obliged to buy pig iron and scrap in the open markets would be at a serious disadvantage."

Cost of Basic Materials an Important Factor

A Pennsylvania munitions manufacturer has found no scarcity of workers lately, but considers that much depends upon the Government's policy as to prices in the awarding of contracts:

"We employed at one time upwards of 2500 men in the manufacture of munitions, of which probably 1500 were engaged in the finishing of munitions, mostly operating lathes. Most of these employees were boys or young men ranging from possibly 16 to 25 years. As the pay was large and the physical effort not excessive it attracted a class of men who ordinarily look for light employment as salesmen in stores or clerical work. Few if any of them were agricultural laborers, although our plant is in the center of a very rich agricultural district.

"Our first contract was terminated in June, 1916, at which time our force was reduced by 1000 munition workers. About 40 per cent of these men obtained work in other munition factories and the remaining 600 found light employment in their former vocations. We believe that very few of these men were fitted by ex-

perience or physical ability for the heavy work involved in agricultural employment, but most of them would make ideal soldiers, as they were young, active and physically strong enough with training to make excellent soldiers. It is from this class of men that the army will obtain most of its recruits and their enlistment will not seriously affect the supply of farm labor. As munition workers, if necessary, many of their places can be filled by young women.

"We are at the present time filling orders for munitions for the United States Government and so far have had no difficulty in obtaining sufficient male employees for our munitions plant.

"On the subject of Government contracts we are not prepared to express any definite opinion until the new methods proposed are put into effect. It is obvious that any method of placing contracts on the cost plus basis to effect any great economy must start with the raw materials, and the cost of production of raw materials is very largely a question of the supply and compensation of what is known as heavy labor. For instance, to-day there is no scarcity of blast furnace capacity or ore, but the supply of coke is short and the price is fixed by the scarcity of labor and the necessity of the consumer.

"Any attempt to regulate the price of pig iron must start, therefore, with coke, which is the main element of cost to-day, and it is a question whether the Government can reduce the cost of coke without compelling skilled labor to engage in coke production. The cost plus basis can probably be applied successfully to the large producers of steel that control their own sources of raw material and all the intermediate processes to the finished steel.

"A company starting with pig iron as a raw material could not furnish steel at equivalent prices unless pig iron is supplied in sufficient quantity at prices far below the present market price. It is obvious, therefore, that no general rule can be applied to all cases, but that all these details will have to be worked out by competent and experienced persons.

"We believe that the methods of buying and conduct of business of the War and Navy Departments will require radical changes before they will be fitted for the purchase and supply of the vast quantities of material which may be required in the war with Germany. We understand that this subject is receiving very earnest attention on the part of the Administration.

Selective Conscription Favored

From a Central Western company which has done considerable munitions work:

"We are greatly in hopes that enough sanity still remains in Congress to make possible selective conscription, such as outlined in the general staff bill. If this is the case, the industries, which will form a great part in the organization of an army, will be kept intact and there will be no danger of a shortage of skilled workers either in the metal industries or in agricultural work. In this line, the writer thinks all publications such as yours should flood Congress with telegrams and communications, insisting that these measures be adopted."

Two Important Men Taken by Government

A New England company writes:

"We are having this matter brought forcibly to our attention this week. A year ago we took on a couple of contracts for making shrapnel. It took us four or five months to get the necessary experience so that we could turn them out in large quantities. Operations in certain departments were harder than in others. The foremen of those two departments are

leaving us this week, one to go into the navy and the other into the aviation service. These particular two men are worth more to our Government and to us, if we were making shrapnel or shells, than in almost any other position in which they could be placed.

"Some arrangement should be made so that in case we took on Government contracts men with special knowledge who have already volunteered or gone into the navy or other arms of the service should be ordered back where their knowledge and experience would be of the greatest value."

Will Food Products Be Reduced?

A New England company calls attention to the failure of agricultural producers to lower prices:

"Our company has just completed foreign munition contracts, but we expect to secure business from our Government in the near future. We do not know yet how the present political situation is going to affect business. We are inclined to believe that it should stimulate business. If the farmers take the same attitude that is being taken by the manufacturers with re-

gard to profits on Government work, then we should see a quick drop in prices on food products."

Labor and Materials Will Be Higher

A New York State company having to do with railroad work makes this comment:

"From our own experience and observation, there is every indication that manufacturers are bound to meet with not only a shortage of labor, particularly common labor, but are going to be embarrassed in securing deliveries of raw materials, etc., due to the same causes. As bearing upon this subject, I am inclosing a communication just received from a Pittsburgh supply house, which may be of some interest. [It predicts higher prices on iron and steel and mill supplies.]

"It is, of course, impossible at this time to predetermine just how far reaching the present conditions will develop into, but it is almost certain that unless there should be a cessation of the world's hostilities within the next few months, which does not seem to be likely, our country will be obliged to suffer to a very considerable degree by reason of these conditions."

The President's Call to Industry

Of high importance, as the country is marshaling its resources of every description to make them count for the most in the war, is the proclamation to his fellow-countrymen issued by President Wilson April 15. That it may have the emphasis of a re-reading by all to whom THE IRON AGE comes we reprint below the body of the document, including all the portions particularly addressed to industry:

A Great Task Calling for Large Service

"We are rapidly putting our navy upon an effective war footing and are about to create and equip a great army, but these are the simplest parts of the great task to which we have addressed ourselves. There is not a single selfish element, so far as I can see, in the cause we are fighting for. We are fighting for what we believe and wish to be the rights of mankind and for the future peace and security of the world. To do this great thing worthily and successfully we must devote ourselves to the service without regard to profit or material advantage and with an energy and intelligence that will rise to the level of the enterprise itself. We must realize to the full how great the task is and how many things, how many kinds and elements of capacity and service and self-sacrifice it involves.

"These, then, are the things we must do, and do well, besides fighting—the things without which mere fighting would be fruitless:

"We must supply abundant food for ourselves and for our armies and our seamen, not only, but also for a large part of the nations with whom we have now made common cause, in whose support and by whose sides we shall be fighting.

Ships and More Ships

"We must supply ships by the hundreds out of our shipyards to carry to the other side of the sea, submarines or no submarines, what will every day be needed there, and abundant materials out of our fields and our mines and our factories with which not only to clothe and equip our own forces on land and sea, but also to clothe and support our people, for whom the gallant fellows under arms can no longer work; to help clothe and equip the armies with which we are co-operating in Europe, and to keep the looms and manufacturing there in raw material; coal to keep the fires going in ships at sea and in the furnaces of hundreds of factories across the sea; steel out of which

to make arms and ammunition both here and there; rails for wornout railways back of the fighting fronts; locomotives and rolling stock to take the place of those every day going to pieces; mules, horses, cattle for labor and for military service; everything with which the people of England and France and Italy and Russia have usually supplied themselves, but cannot now afford the men, the materials, or the machinery to make.

Industry Must Be More Efficient

"It is evident to every thinking man that our industries, on the farms, in the shipyards, in the mines, in the factories, must be made more prolific and more efficient than ever, and that they must be more economically managed and better adapted to the particular requirements of our task than they have been; and what I want to say is that the men and the women who devote their thought and their energy to these things will be serving the country and conducting the fight for peace and freedom just as truly and just as effectively as the men on the battlefield or in the trenches. The industrial forces of the country, men and women alike, will be a great national, a great international service army—a notable and honored host engaged in the service of the nation and the world, the efficient friends and saviors of free men everywhere. Thousands, nay, hundreds of thousands, of men otherwise liable to military service will of right and of necessity be excused from that service and assigned to the fundamental, sustaining work of the fields and factories and mines, and they will be as much part of the great patriotic forces of the nation as the men under fire.

Food a Supreme Need

"I take the liberty, therefore, of addressing this word to the farmers of the country and to all who work on the farms: The supreme need of our own nation and of the nations with which we are co-operating is an abundance of supplies, and especially of foodstuffs. The importance of an adequate food supply, especially for the present year, is superlative. Without abundant food, alike for the armies and the peoples now at war, the whole great enterprise upon which we have embarked will break down and fail. The world's food reserves are low. Not only during the present emergency, but for some time after peace shall have come, both our own people and a large proportion of the people of Europe must rely upon the

harvests of America. Upon the farmers of this country, therefore, in large measure rests the fate of the war and the fate of the nations. . . .

"The Government of the United States and the governments of the several States stand ready to cooperate. They will do everything possible to assist farmers in securing an adequate supply of seed, an adequate force of laborers when they are most needed, at harvest time, and the means of expediting shipments of fertilizers and farm machinery, as well as the crops themselves when harvested. The course of trade shall be as unhampered as it is possible to make it, and there shall be no unwarranted manipulation of the nation's food supply by those who handle it on its way to the consumer. This is our opportunity to demonstrate the efficiency of a great democracy, and we shall not fall short of it!

"This let me say to the middlemen of every sort, whether they are handling our foodstuffs or our raw materials of manufacture or the products of our mills and factories: The eyes of the country will be especially upon you. This is your opportunity for signal service, efficient and disinterested. The country expects you, as it expects all others, to forego unusual profits, to organize and expedite shipments of supplies of every kind, but especially of food, with an eye to the service you are rendering and in the spirit of those who enlist in the ranks, for their people, not for themselves. I shall confidently expect you to deserve and win the confidence of people of every sort and station.

Transportation Vital

"To the men who run the railroads of the country, whether they be managers or operative employees, let

me say that the railroads are the arteries of the nation's life and that upon them rests the immense responsibility of seeing to it that those arteries suffer no obstruction of any kind, no inefficiency or slackened power.

"To the merchant let me suggest the motto, 'Small profits and quick service,' and to the shipbuilder the thought that the life of the war depends upon him. The food and the war supplies must be carried across the seas, no matter how many ships are sent to the bottom. The places of those that go down must be supplied, and supplied at once. To the miner let me say that he stands where the farmer does: the work of the world waits on him. If he slackens or fails, armies and statesmen are helpless. He also is enlisted in the great Service Army.

"The manufacturer does not need to be told, I hope, that the nation looks to him to speed and perfect every process; and I want only to remind his employees that their service is absolutely indispensable and is counted on by every man who loves the country and its liberties.

"Let me suggest, also, that every one who creates or cultivates a garden helps, and helps greatly, to solve the problem of the feeding of the nations; and that every housewife who practices strict economy puts herself in the ranks of those who serve the nation. This is the time for America to correct her unpardonable fault of wastefulness and extravagance. Let every man and every woman assume the duty of careful, provident use and expenditure as a public duty, as a dictate of patriotism which no one can now expect ever to be excused or forgiven for ignoring. . . .

"The supreme test of the nation has come. We must all speak, act, and serve together!"

Government Selects Site for Armor-Plate Plant

Charleston, West Virginia, is the Favored Place—Details of Plant's Equipment—No Blast Furnaces Contemplated in Scheme

WASHINGTON, April 17, 1917.—The selection of Charleston, W. Va., as the site for the Government armor-plate plant was announced April 12 by the Secretary of the Navy. This is pursuant to the terms of the naval appropriation act of Aug. 29, 1916, which carried the sum of \$11,000,000 for a plant of 20,000 tons annual capacity "to be located at a place approved by the General Board of the Navy with especial reference to the considerations of safety in time of war." According to Secretary Daniels, work "will be commenced at once and driven to quick completion."

The Special Advantages of Charleston

In selecting Charleston for the site of this plant, the General Board of the Navy states that it is in full accord with the military principle adopted by the Army War College that "no supply depot, arsenal, nor manufacturing plant, of any considerable size, supported by War Department appropriations for military purposes, should be established or maintained east of the Appalachian Mountains, west of the Cascade or Sierra Nevada Mountains, nor within 200 miles of our Canadian or Mexican borders, and steps should be taken gradually to cause to be moved depots and manufacturing plants already established in violation of this military principle."

The Armor Plant Board visited no less than 30 cities and in addition gave hearings to the representatives of a large number of other cities, but finally selected Charleston as embodying to the greatest extent the combined advantages desired for this establishment. According to the board, the West Virginia district has

the great advantage of near access to some of the best coal-mining regions in the United States; pig-iron markets are not far removed; oil and natural gas are available; water-power plants may be developed to a certain extent, although the cheap price of coal makes it possible for coal-fired power plants to compete with the hydraulic power. This district is close to the great steel industrial labor market of Pennsylvania, and the cost of assembly of raw materials is very low. The board summarized its conclusions as follows:

The board having determined that the Pittsburgh district is the best location for the armor plant has also carefully weighed the relative advantages of the several districts within the limits of safety, as outlined by the general board, and finds that the West Virginia district, from Cumberland, Md., to Ironton, Ohio, possesses more advantages than any of the others. Within this district Charleston, W. Va., and Cumberland, Md., are the most favorably located, in the order named. The first possesses the advantage of the low cost of assembled materials and favorable local conditions of the site, while the second possesses the advantage of being in closer proximity to the best labor and supply market in Pennsylvania and the distribution of the finished products of the plant.

Aside from the location of the plant in a district like Pittsburgh, based upon purely industrial and economic grounds, the board recognizes the many advantages that would accrue from having the plant located in close proximity to the present gun factory and proving ground on the Potomac River in the vicinity of Washington. The output of the armor plant, particularly if it is combined with a projectile and gun forging plant, will be so closely associated with the work of the gun factory and proving ground that the advantages in administration, in experimental work and development, and in avoiding costly delays, would offset the increased cost of raw materials.

Secretary of the Navy Daniels also says: "Charles-

ton offers to the Government, without cost, the choice of various eligible sites, and, in addition to this plant location, extends the pick of several protected gorges admirably adapted for use as proving grounds. This in itself means a tremendous saving in both money and time. As it is now, all armor plate, when finished, must be shipped for testing to Indian Head, near Washington, a slow process and expensive. This combination of plant and proving grounds is not by any means the least of Charleston's peculiar and superior advantages."

the time it was presented, and in the interval the cost of much of the equipment has risen by leaps and bounds. Whether a special additional appropriation will be solicited from Congress or the Secretary of the Navy will find that he has authority to utilize for this purpose other funds already appropriated cannot be stated, but there is no doubt that plenty of money will be available to carry out what is regarded by experts as the most extraordinary experiment in manufacturing ever undertaken by the Government.

No estimate for the manufacture of any special

Open-Hearth Plant Details

	Cost		
Building, structural steel and galvanized-iron construction, including crane runways.....	\$374,000	Breast planers, to plane ends of plates 32 x 14 ft. by 18 in. thick.....	\$130,000
Cranes, electric traveling and jib.....	120,000	Pit planer, to plane plates 20 x 35 ft. by 18 in. Standard planers, to plane 12 ft. wide by 26 ft. long.....	63,000
Furnaces, includes stacks, flues and regenerative chambers.....	300,000	Standard planers, to plane 14 ft. wide by 26 ft. long.....	53,700
Electric charging machines.....	30,000	Standard 3 x 3 x 10 ft. planer, 4 heads.....	65,000
Ladles.....	14,300	Rotary planer and saw combined, 73-in. diameter head, 28 ft. longitudinal travel.....	4,000
Casting pit, concrete.....	20,000	Rotary saws, 73-in. diameter, 28 ft. travel (saw-blades not included).....	16,000
Bogies, charging cars.....	15,500	Universal drilling and milling machines, post 26 ft. longitudinal and saddle 12 ft. vertical travel.....	60,000
Charging boxes.....	7,000	Portable universal drilling and milling machines, post 24 in. horizontal, saddle 18 in. vertical, and spindle 26 in. horizontal travel.....	100,000
Scales.....	5,000	Two-post universal drilling machines, with 16 ft. between uprights and 8 in. clear in height.....	5,625
Laboratory for carbon determination, must be in open-hearth plant.....	2,000	Radial drill, 6 ft. horizontal, and spindle 3 ft. vertical travel.....	78,750
Flasks for armor, to be made of cast iron, each mold to weight about 200,000 lb.....	96,000	Grinding machines, 36-in. diameter wheel, 32 in. travel.....	13,400
Stock yard.....	25,000	Tool grinders, Bridgeport No. 5.....	29,175
Scrap yard:		No. 1 universal tool grinder, Sellers.....	1,000
Shears.....	8,000	Armor-plate saw-grinding machine.....	1,650
10-ton drop crane.....	7,000	Tindell-Morris saw blades, for saw machines.....	1,300
Crane runways.....	10,000	3 x 36 in. New Model turret lathes.....	10,320
Bins for dolomite magnesite, nickel, etc.....	15,000	Special nut turret lathe.....	6,800
Special rolling stock:		Little Giant (size E) air drills.....	3,200
Ingot transfer cars.....	5,000	Electric hand grinders portable.....	820
Cinder cars.....	4,000	Erecting pit, 12 x 12 x 36 ft. deep.....	1,800
Total.....	\$1,057,800	Erecting beds, 50 x 130 ft.....	5,200
Forging and Bending Shop		Angle erecting stands.....	26,400
Details		Lifting gear, sets.....	7,500
Building, structural steel, with corrugated galvanized-iron sides.....	\$760,000	Test cutters.....	2,240
Furnaces:		Cast-steel lifting dogs.....	9,000
Ingot-heating.....	96,000	Cutting tools for planers, saws, etc.....	4,800
Regenerative, car-bottom, plate-heating.....	275,000	Large mills with inserted blades.....	41,400
Forging presses, with intensifiers and pumps, piping and cranes, completely installed.....	1,200,000	Small mills, miscellaneous.....	1,120
Cranes.....	171,500	Sockets for mills, drills, etc.....	5,874
Tanks for water and oil, with pumps.....	45,000	Boring bars for drilling and milling machines.....	800
Dies and tools.....	125,000	Flat, twist, and trepanning drills.....	1,000
Scaling machines.....	6,000	Taps for bolt holes, nuts, and miscellaneous.....	11,500
Pipes for steam, air, and water, including drains.....	50,000	Gages, plug and ring, for bolts and nuts.....	20,500
Total.....	\$2,728,500	Tap wrenches for miscellaneous taps.....	1,100
Cementing and Tempering Shop		Ratchet wrenches for tapping, etc.....	75
Details		Clamps, bolts, stops, etc. for setting up and securing work on machines.....	125
Building, structural steel, with galvanized-iron sides, including crane runways.....	\$760,000	Gages, templates, etc., for inspecting plates.....	5,250
Furnaces, regenerative, car-bottom, for cementation and treatment.....	962,500	Miscellaneous sledges, hammers, pinch bars, surface gages, straight-edges, measuring tapes, center punches, hose for air and water, etc., all types.....	3,000
Cranes.....	125,000	Emery and corundum wheels for grinders, all types.....	1,900
Spraying apparatus.....	44,000	Tools for toolroom:	2,000
Piping, water, steam, air and drains.....	15,000	16-in. toolroom lathe.....	1,200
Water reservoirs.....	6,000	30-in. toolroom lathe.....	5,330
Total.....	\$1,912,500	Milling machine.....	2,450
Machine Shop		Tool grinder.....	500
Details		Universal grinding machine.....	1,500
Building, with 2 spans 75 ft. each—about 600 ft. for 10,000-ton plant; about 800 ft. for 20,000-ton plant.....	\$480,000	Drill presses.....	1,400
Cranes:		Workbenches.....	125
100-ton single-trolley traveling, 25-ton auxiliary.....	50,000	Gages.....	800
75-ton single-trolley traveling, 10-ton auxiliary.....	43,000	Vises.....	150
75-ton double-trolley traveling, each trolley 37½ tons.....	48,000	Miscellaneous small tools and equipment.....	1,500
Machine tools and equipment:		Arbor presses, tool stands, tote boxes, etc.....	800
Edge planers, to plane edges of plates 32 ft. long by 18 in. thick, any angle.....	72,000	Installation of above tools, inclusive of foundations, wiring, etc.....	210,000
		Soda water system.....	7,000
		Heating.....	21,000
		Scale, 75-ton capacity.....	2,500
		Total.....	\$1,744,869

Cost of Plant Will Exceed Appropriation

The plans of the Naval Bureau of Ordnance for the construction of an armor plant have already been worked out in considerable detail, although, in view of the extraordinary market conditions which have developed since the data concerning construction and equipment were prepared, much revision will no doubt be necessary, and it is the best opinion here that a large sum will be required to supplement the appropriation by Congress, which fixed the limit of cost at \$11,000,000. This figure was regarded as extremely conservative at

treatment steel is included except that required for the turret and conning tower tops. For the production of 20,000 tons of finished armor plate per year it is calculated that about 70,000 tons of ingots would have to be cast, and, because of certain difficulties, the plant would be able to average only 250 days per year, which would mean that 280 tons of armor ingots would have to be cast each day. Experts realize the difficulty of constructing and operating an armor factory on a plan differing so markedly from that pursued by all the private armor manufacturers whose armor-plate factories are adjuncts of completely integrated steel works.

The General Scheme of the Works

The Government factory starts with an open-hearth plant, in which will be made all of the steel from which the armor is to be fabricated. The building will be constructed on such levels as to best accommodate the five open-hearth furnaces and the 10 accompanying gas producers.

The forging and bending shop will have three 14,000-ton presses, capable of forging and bending the thickest and heaviest armor. In the armor plants of domestic manufacturers the forging and bending presses have heretofore been of the hydraulic type, the use of which necessitates a very high-power pumping engine. Consideration has been given, however, to the possible installation of the steam intensifier type of forging press, the manufacturers of which assert that it is entirely practicable to use this type for the forging and bending of armor, such presses being largely used abroad and being much cheaper than the hydraulic press. This matter is now under careful investigation. This shop will also contain ingot-heating and car-bottom plate-heating furnaces for the heating of ingots and plates preparatory to forging, re forging and bending.

In the cementing and tempering shop the armor plate will be carbonized and heat treated and finally water-hardened. It will contain a large number of car-bottom, plate-heating furnaces and water-hardening sprays, piping and reservoirs, required for tempering.

The machine shop will be built in two spans and will be heated and well lighted, in order that machine-tool work may be done in comfort at all times. It will contain the machine tools for finishing armor plate. There will also be the necessary surface plates for the erection of the armor before it leaves the shop.

Estimates of Cost of Equipment

Tentative estimates have been prepared covering the bulk of the equipment of the armor-plate works, that of the open-hearth plant, forging and bending shop, cementing and tempering shop and machine shop being given in somewhat minute detail on page 958.

The following summary of the total cost of the armor plant, including site and all buildings and equipment, has been prepared.

Even a superficial inspection of the figures presented above will emphasize the necessity for a careful revision of all the estimates upon which the appropriation for the armor factory is based. No less interesting, however, are the figures prepared by the Armor Plant Board showing the scale of salaries at which it is expected to secure experts sufficiently accomplished to turn out high-class armor in all respects equal to that which the Government has heretofore procured from private manufacturers. These estimates are as follows:

General Officers	
	Salary
General superintendent	\$15,000
Open-hearth superintendent	6,000
Forging-plant superintendent	5,000
Armor-treatment superintendent	5,000
Machine-shop superintendent	4,000
Chief engineer of plant	4,000
Metallurgist	6,000
Chemist	2,500
Total	\$47,500

In preparing all the figures above presented the board frankly drew attention to "the great difficulty of making a close estimate of the cost of manufacturing armor in the absence of experience in such manu-

Summary of Cost of Armor Plant		
	Details	Cost
Site, grading and clearing, fence		\$34,000
Office		74,000
Physical and chemical laboratory		71,062
Miscellaneous shops and buildings		247,636
Locomotive house and rolling stock		169,300
Boiler plant		457,000
Hydraulic system		55,000
Electric power house and transmission lines		351,325
Gas producer house		442,250
Cold storage and crushing plant		47,200
Open-hearth plant		1,057,800
Forging and bending shop		2,728,500
Cementing and tempering shop		1,912,500
Machine shop		1,744,869
Total		\$9,392,642
10 per cent incidentals, engineering expenses, unforeseen contingencies		939,462
Grand total		\$10,331,906

facture." For a variety of reasons it is evident that even the approximate cost of the Government armor-plate factory will not be known until the establishment is completed and the bills audited and paid.

W. L. C.

Cleveland Manufacturers on Effects in Industry

CLEVELAND, OHIO, April 16, 1917.—Cleveland manufacturers are practically unanimous in the opinion that business in the metal working industries will be stimulated by this country's entry into the war. The demands of the Government are expected to cause a further speeding-up of production in plants already filled beyond their capacity. Government orders, it is also expected, will cause a side-tracking and further delay in deliveries by manufacturing plants now unable to keep up with production. It is also expected that the labor situation will become even more acute during the next few months, because of the taking of large numbers of men from the industries for military service. The only cloud on the industrial horizon, outside of the scarcity of labor and material, is that caused by the possible effect of very high taxes to cover by current revenues an undue proportion of the burden of the war.

A leading representative of the pig-iron industry expressed this view of the situation: "Business cannot be better than it is now. The only reaction that could come from our entry into the war would be caused by the imposition of enormous war taxes. I think the war will cause pig iron producers to become more conservative about selling."

A large manufacturer of crane and steel plant

equipment is of the opinion that the war will materially increase his company's business, "owing to the demand of the Navy Department for cranes, and the call from steel plants for additional handling and other equipment. Steel companies are now inquiring for additional equipment in anticipation of the heavy demands of the Government for steel."

In the opinion of several machine tool manufacturers, there will be a stimulated demand for their products, although one expressed the view that there will not be much additional call for machinery for making munitions, owing to the fact that already a large number of well-equipped plants of this character have finished export orders and can be turned over almost immediately to the production of American munitions.

Expressions from Metal-Working Companies

Cleveland Hardware Company: "The war will accentuate the scarcity of material and is likely to make a serious shortage for a long time. The Government has the right-of-way and other consumers will have to take material that is left. If the light forging industry is affected at all, it will be indirectly, by an increased demand from plants having Government orders. The taking of men from the industries will doubtless make

the scarcity of labor more serious than it has been during the past year or more."

Hydraulic Pressed Steel Company: "We feel that the demand on steel plants and on about all metal working industries will be greatly increased."

Brown Hoisting Machinery Company: "We believe that it will be the policy of the Government to stimulate production in American plants to supply the demands of the Allies, and to take the remainder for our own needs. Our Government is planning to go ahead with a program which evidently means a marked increase in activity in our metal working plants for at least six or eight months. In our own case we already notice this increased activity in the demand for cranes for navy yards and fortifications."

National Acme Company: "We feel that our entry into the war will cause an immediate stimulation in business, and we are going ahead with our plans on that presumption. We also feel that after the war there will be a heavy demand for machine tools in our line for at least two or three years."

Cleveland Twist Drill Company: "We anticipate that our entry into the war will mean an increased pressure on us sooner or later. An enormous quantity of twist drills is required in the manufacture of munitions."

Bourne-Fuller Company: "The heavy demand of the

Government on the steel mills will aggravate the situation in steel and it will be a serious problem to meet all demands. Industry will doubtless be speeded up along all lines, and we do not look for a let-up in any industry unless the Government enforces such high taxes on manufacturing corporations and individuals that retrenchment will be necessitated."

Wages of Enlisting Employees

The W. S. Tyler Company has notified its employees that those who enlist will receive their full wages during the time they are in the Government service. This applies to all men who have been in the company's employ at least six months. A number of other Cleveland companies announce that they will do something for their employees who enlist, but have not yet worked out definite plans for this. There is a disposition among many of the employers to avoid encouraging their men to leave their plants and join the army, believing that skilled workmen should not be taken from the industries for military service. However, no obstacles are being placed in the way of men who wish to enlist. Some manufacturers feel that they would be encouraging their men to enlist by offering them their wages in full or in part while they are away, and for this reason have not decided upon any policy for keeping on the pay-roll their employees who do enlist.

Labor Questions Growing Out of the War

The LeBlond Works and Enlistment

At an employees' meeting of the R. K. LeBlond Machine Tool Company, Cincinnati, held April 11, John A. LeBlond, works manager, outlined the company's policy as follows:

"Since the latter part of last week our country has been officially at war with one of the great powers of Europe. This event is one of serious importance to all of us, and one which should not be taken lightly. No man or group of men can foretell where war will lead a nation, when it will end, or what sacrifices the people may be called upon to make, but there is no cause for us at this time to become excited or nervous.

"Every person should decide what his duties to his country are at this time. I wish to state that my position and the position of this company is one of unswerving allegiance and obedience to President Wilson and his advisers, and I believe that this is your position also.

"To those employees who think it to be their duty to enlist in any branch of the Government service this company will not attempt advice; we leave it to the men's discretion. Our policy, however, toward any who enlist will be, first, to assure each of them his job or one equally as good when he returns home; second, that his insurance policy will be continued in force, if the insurance companies will allow this, and I believe they will.

"We have also decided to pay an amount equal to 50 per cent of the loss in wages due to enlistment. In other words, we will go fifty-fifty on losses, and if this war continues to a point where a man with a family or having others dependent upon him is called into service he can rest assured that this company will see to it that his family or dependents are taken care of to the best of our ability."

Good Earnings of Armory Employees

Col. W. S. Peirce, commandant of the Springfield Armory, Springfield, Mass., issued a statement April 14 in which were set forth the average earnings and the working conditions in that well-known Government plant. He says:

"The figures given show what the employees of this

armory are now being paid for the work they do in connection with the national defense. While the employees are now called upon to work 10 hours instead of the usual eight, for this extra effort they are paid at the rate of time and a half. In addition to this, the annual leave with pay allowed them has within the past year been increased from 15 days to 30 days. It will be seen from this that in a time of national emergency, when citizens generally are being called upon to render service to the Government at more or less personal sacrifice, when manufacturers are refusing other highly profitable work in order to take Government work on small margins of profit, the employees of this armory have been called upon for no corresponding sacrifice,

Average Earnings of Armory Employees

Designation	Day Workers For 10-hr. Day		Piece Workers Average Daily Earnings
	Minimum	Maximum	
Barrel drillers .....	...	...	\$5.51
Barrel riflers .....	...	...	4.68
Barrel turners .....	...	...	4.70
Barrel reamers .....	...	...	5.06
Flers .....	...	...	5.52
Millers .....	...	...	4.72
Profilers .....	...	...	5.93
Drillers .....	...	...	5.44
Punch press operators .....	...	...	5.54
Stockers .....	...	...	5.48
Shavers .....	...	...	5.85
Screw machine operators .....	...	...	5.13
Gagemakers	\$5.50	\$6.53	...
Toolmakers	5.16	6.19	...
Machinists	4.81	5.84	...
Woodworkers .....	...	...	5.35
Tool grinders	5.16	5.50	...

but on the contrary have been given increased leave privileges and pay at a higher rate for the extra hours they are asked to work. From actual figures obtainable their present daily earnings compare very favorably with the rates paid by private factories in this vicinity for work of like character and grade. In view of these facts, I think there can be no reasonable doubt that the Government has made adequate and liberal provisions for the employees of this armory, and is therefore entitled to rely upon them for a loyal and wholehearted co-operation in the emergency that confronts us all.

"The piece-work earnings given are the average earnings for one week of all employees of the trade in

question. This fact is important when it is remembered that nearly two-thirds of the present force consists of new men whose earning capacity has not yet in most cases reached that of the more experienced old force. As these new men gain in experience they should, if they apply themselves with reasonable industry, raise the average earnings materially."

Modification of Federal Labor Laws

The directors of the National Association of Manufacturers at a special meeting held in New York, April 12, realizing that harmonious industrial relations are essentials to secure adequate national defense, indorsed the resolutions adopted by the Committee on Conservation and Welfare of Workers, authorized by the Advisory Council of the Council of National Defense, as follows:

First—That the Council of National Defense should issue a statement to employers and employees in our industrial plants and transportation systems advising that neither employers nor employees shall endeavor to take advantage of the country's necessities to change existing standards. When economic or other emergencies arise requiring changes of standards the same should be made only after such proposed changes have been investigated and approved by the Council of National Defense.

Second—That the Council of National Defense urge upon the legislatures of the States as well as all administrative agencies charged with the enforcement of labor and health laws, the great duty of rigorously maintaining the existing safeguards as to the health and welfare of workers, and that no departure from such present standards, in State laws or State rulings affecting labor should be taken without declaration of the Council of National Defense that such departure is essential for the effective pursuit of the national defense.

Third—That the Council of National Defense urge upon the legislatures of the several States that before final adjournment they delegate to the Governors of their respective States the power to suspend or modify restrictions contained in their labor laws when such suspension or modification shall be requested by the Council of National Defense; and such a suspension or modifications, when made, shall continue for a specified period and not longer than the duration of the war.

To supplement the foregoing, the association's board of directors recommends:

Fourth—That the Council of National Defense recommend to the Congress of the United States before adjournment that it authorize the President of the United States to suspend or modify restrictions contained in Federal labor laws when such suspension or modification shall be requested by the Council of National Defense, such suspension or modifica-

tion to continue for a specified period, but not longer than the duration of the war.

Realizing further the grave obligation of citizenship in this national crisis, we pledge to the Government without reservation the resources of our association and the services of its officers.

Manufacturers Urge That Steel Workers Be Given Status in Government Service

Three important independent steel companies have addressed the following letter to the Secretary of War calling attention to the possibility of steel workers being drawn from the industry into the army and suggesting legislation giving such employees an honorable status in the service of the Government:

Hon. Newton D. Baker,
Secretary of War,
Washington, D. C.

Dear Sir:—We desire to point out to you the fact that in war time especially, the interests of the nation are inseparably bound up with those of the iron and steel industry.

In preparing for and conducting a war, the men who mine and transport the raw materials, together with those who, in the mills and shops, transform these materials into the steel products necessary for the building of ships and armament, are just as essentially a part of the war machine as the men who man the ships or fire the shells on the field of battle.

With the tide of patriotism running so high, however, it is too much to expect that these men will be content to remain at their posts while other men in the same communities are enlisting for active service at the front. This is one of the great problems which the men in authority at Washington must solve without too much delay.

It would seem to us that if these men are to be expected to continue at work, they must be given a definite and honorable status, which will at least approximate that of their comrades who assume the more hazardous service at the front. Pending the necessary legislation on this subject, would it not be practicable for the President to issue a general proclamation emphasizing the fact that it is vitally necessary for the national defense that men in certain selected industries should remain at their posts, at least until the national authorities have decided that their services will be more valuable to their country elsewhere, and that legislation will be requested which will give them an honorable status in the Government service?

Very respectfully yours,

REPUBLIC IRON & STEEL COMPANY,
By Jno. A. Topping, Chairman.
LACKAWANNA STEEL COMPANY,
By E. A. S. Clarke, President.
MIDVALE STEEL & ORDNANCE COMPANY,
By Wm. B. Dickson, Vice-president.

Many Important Measures at Washington

WASHINGTON, April 17, 1917.—War history has been rapidly making during the past week. The House of Representatives and Senate, with no dissenting vote, have passed a bill providing for bond issues aggregating \$7,000,000,000, of which at least \$2,000,000,000 are to be loaned to the Allies. The vote was taken in the Senate to-day after a single day's debate. The bond issue is the largest ever proposed by any nation.

Following closely on the heels of the bond bill is a statement prepared by Secretary McAdoo outlining the sources of revenue from which funds are to be derived to meet a large share of the cost of carrying on the war and to provide a sinking fund for extinguishing the big loan authorized by the bond bill. The Secretary's project contemplates taxation aggregating \$1,807,250,000 per annum, or approximately one-half the estimated cost of the first year of the war. The money is to come largely from increased income and excess profits taxes. The Secretary proposes to lower the income tax exemption from \$3,000 to \$1,500 for unmarried persons and from \$4,000 to \$2,000 for married persons, to leave the normal tax at 2 per cent, but to raise the super-taxes materially so as to net altogether from this source about \$340,000,000. This plan contemplates

no increase in the corporation income tax. The revised arrangement of super-taxes on incomes is as follows: Incomes of \$3,000 to \$4,000, 1 per cent; \$4,000 to \$5,000, 2 per cent; \$5,000 to \$10,000, 5 per cent; \$10,000 to \$20,000, 7 per cent; \$20,000 to \$40,000, 8 per cent; \$40,000 to \$60,000, 10 per cent; \$60,000 to \$80,000, 12 per cent; \$80,000 to \$100,000, 15 per cent; \$100,000 to \$150,000, 20 per cent; \$150,000 to \$200,000, 25 per cent; \$200,000 to \$1,000,000, 33½ per cent; \$1,000,000 and over, 40 per cent.

The increase in the excess profits tax both by making the present law applicable to the calendar year 1916, and applying new increases next year, the Secretary estimates would raise \$226,000,000 this year and \$200,000,000 additional next year. In this connection he says:

If the present excess profits tax of 8 per cent on corporation and partnership profits of more than \$5,000 and 8 per cent of invested capital were made applicable to the calendar year, 1916, it would yield \$226,000,000. Corporations and partnerships would be given until September to pay the tax.

As to the excess profits tax for 1917, collectible in June,

(Continued on page 989)

ESTABLISHED 1855

THE IRON AGE

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War Remaking the Fabric

Enough can be seen already to render it clear that much of our financial, industrial and economic fabric is to be remade through our participation in the war. The bigness of the United States, to which graceful reference has been made by representatives of the Entente Allies, makes our participation in the war correspondingly big, and the bigness of our war effort makes it that the natural effects will not be toned down by the influence of conditions in other countries.

The early figures of our trade balance, when buying from abroad was getting fairly under way, caused a gasp of astonishment. Monthly trade balances of \$110,000,000 to \$174,000,000, which obtained up to October, 1915, were though too great to last, but yielded to balances ranging from \$310,000,000 to \$372,000,000 in each of the six months ending last January. The trade balance accumulated to date, after deducting for debits arising from the small balance of 1914 and allowing for the unseen and unfavorable balance, amounts to nearly \$5,000,000,000, a total that few if any supposed could be rolled up, but the financing about to be done by the Government in favor of the European Allies promises to add, with some divergence either way, three billions more. The five billions was an enormous sum, but the Government proposes to borrow, in one series of operations, the sum of seven billions.

A good bit is being said these days about our not repeating the mistakes that England and other countries made in their early days of war. No doubt; but it will be the greatest mistake of all if we assume that our so profiting by their experience insures us against making any mistakes. There are plenty more that can be made. One that we can avoid is the assumption that because a thing is inconceivable it cannot occur. We are in the midst of what have hitherto been inconceivable things. For instance, it was only last July that one financial writer made an observation that no doubt seemed entirely reasonable to himself, and perhaps to many others, but what he said was, after noting that a billion of foreign loans had been floated in the United States and a large volume of American securities sold back, that no one "can suppose that much further assistance will be forthcoming from New York after the peace, especially if Washington embarks on a

costly war with Mexico!" This interesting dictum was pronounced only nine months ago. Save us from the trying financial experience of a war with Mexico! The foreign loans now total two and a quarter billion, while three billion is about to come.

Congress has hastened to make the five billion bond issue appetizing by freeing the bonds from all tax liability of every description, except as to the inheritance tax, a provision, when applied to so large a loan, which will certainly have an important effect upon other investment securities. So free are we making with financial affairs generally that one financial journal does not hesitate to urge that the issue be made free of the inheritance tax also, the argument being merely that to do so would make the bonds more saleable. As if the Government should sell its birthright merely to save a little interest annually or get rid of the bonds somewhat more easily. Obviously, the fact that the inheritance tax is to be graded would make it that the richer the man the more he would seek to guess the time of his demise and convert his funds accordingly, a spectacle that would not be pleasant to witness.

By a few friendly agreements it has been arranged that there are to be no labor disputes for the duration of the war. The Council of National Defense has been made a greater board of arbitration than anyone could have conceived a few weeks ago. Surely when the war is over we shall not go back to all our old habits. So much will have occurred that many of them will be forgotten.

Throwing the railroads of the country into one system by placing them under the control of the committee of railroad presidents is expected to produce great economies, so much so that in some quarters it is estimated the railroads will be as content with a 10 per cent increase in freight rates as they would have been under the old regime with the 15 per cent they recently asked, the economies counting for 5 per cent. Only one of these economies is the elimination of duplications in competing passenger trains, long a notorious waste. Certainly if the 5 per cent of economy is effected it will not be allowed to stop with the war, and great changes in the relations of the railroads to each other and to the Government will have to be brought about to make the 5 per cent permanent.

The co-operation of so many and such eminent civilians with the regularly constituted Government authorities establishes a condition for the duration of the war that will not be brushed lightly aside at the war's end. Lasting consequences will be produced. The benefit of such service will be recognized, the civilians will be much more in mood to accept regular Government service, and the professional politicians, one may venture to hope, will have become somewhat enlightened as to the philosophy of business men.

These things and many more that might be reviewed show that events of tremendous import are occurring, events that will affect profoundly our whole industrial, social, financial and political life. The greatest mistake we could make would be to underrate their importance. One must not limit his vision by the powers of conception to which he has been used.

Business Men in Patriotic Service

In war times the obscure man of to-day becomes the National hero of to-morrow. In the "Hon. John Grigsby," a play which was made popular some years ago by Sol Smith Russell, Grigsby, an Illinois lawyer, is talking in ante-bellum days with his clerk. The colloquy runs something like this:

"By the way, Jones, did you hear of a speech that a young man by the name of Lincoln made, a few nights ago, down at Springfield?"

"No, I never heard of Lincoln," replied the clerk.

"Well," said the old-fashioned lawyer in the inimitable drawl of Sol Smith Russell, "*You will hear from him.*"

In these days in this great country, with its millions of people, a man may be comparatively obscure so far as the masses are concerned and yet have in him the gray matter and all the moral qualities necessary to make him of great service to his country. For example, Frank A. Scott, who has been appointed chairman of the general munitions board just organized by the Council of National Defense, although well known in metal-working circles, is unknown even to many business men outside of his home city, Cleveland; but those who know him and have watched his career have no fears as to the kind of a record he will make at Washington. In his work as secretary of the Chamber of Commerce at Cleveland, as receiver of the Cleveland street railway system, as a banker and as an official of the Warner & Swasey Company, Mr. Scott has shown qualities that will insure his success in meeting the many problems of the munitions board throughout the war period. He was one of the first men in the country to come to a full realization of conditions connected with the European war, and articles he wrote attracted wide and favorable attention.

The names of President Willard of the B. & O. Railroad, Herbert C. Hoover, who will head the new food board of the Government, and of a few others connected with the Council of National Defense in an advisory capacity are well known in the United States, but doubtless there are other men, not conspicuous heretofore, who will render distinguished service to their country. Strong

evidence is being presented every day that in meeting what may prove to be crucial tests of the executive ability of the leaders of the country, business men of large caliber will play an important part.

Contract or Cost Plus?

Serious consideration must be given to the manner in which the Government is to place its orders for materials required in its preparation for entrance into the war. Particularly is this true if there is to be whole-hearted co-operation of manufacturers. It is probably true that the manufacturers of primary munitions know quite well where they stand on future costs of raw materials and are assured of the source and the prompt delivery of those supplies. But it is equally certain that many smaller manufacturers, who have been asked to bid upon products they can well make, are holding back because they know not where, when or at what price they can secure the materials for a contract which will extend over a period of six or more months.

Is it any wonder that they look askance at invitations to bid for Government work when they know that they must go into an uncertain open market to secure their own supplies, or when they are harassed by the uncertainty of labor supply? When a manufacturer of small tools, located in an isolated community, loses 23 expert workmen by the calling out of the National Guard and has no assurance that they will be returned, should one blame him if a wrinkle or two come into his forehead? Five of those men were engaged directly upon Government work and he knows not where there are five equally expert men to replace them. Under these conditions does a contract at a fixed price offer an adequate incentive to strive for lower costs and larger output?

It has been suggested that there is a better way to secure Government supplies of manufactured products than by the method of soliciting or advertising for bids. It is that the Government place its orders on a basis of determined cost plus a fair percentage of profit. Lowered costs would then mean a diminution of gross profits. To overcome this and to stimulate greater efficiency in manufacturing operations and processes, let the producer share with the Government any gains which may be the result of increased efficiency and lowered costs. Business relations predicted upon such an agreement would remove uncertainty from the mind of the manufacturer and he could throw his whole energy into the production of supplies the Government sorely needs.

The advocates of the contract method express the opinion that the Government will assume the control of the distribution of raw materials, machinery and labor and will take steps to stabilize the cost of these three essentials. Whatever may come later, many a manufacturer now asked to bid has seen no direct evidence of such control yet. These contract advocates see in the cost plus method of placing orders not only a ready means of upsetting labor conditions but also, as they view it, the certainty of such an effect. They go

so far as to say that on a cost plus basis, the tool and gage makers and other employers of help that is already scarce will again push up the hourly rates of labor that they may get larger volume both of production and profits. The manufacturer supplying private demand will then find it difficult to advance the price of his goods enough to meet these new wage rates.

There are well-authenticated reports that the eight-hour basic day rule on Government work is being suspended in some cases, but this has not become general and more than one employer who honestly wants to do his part in providing needed supplies has not seen his way clear to bid on contracts with the eight-hour proviso included. He has fought for years against the eight-hour day in the sincere belief that it has not been proved economically sound and he does not see how he can run a part of his establishment on an eight-hour basis with time and half time for overtime without demoralizing the remainder of his working force. He fears the eight-hour day, too, because it so frequently precedes or accompanies the usual demands for the closed shop and complete unionization of the working force. Thus the eight-hour day, too, becomes a factor in Government purchasing, one on which a definite and clear policy should be established as soon as possible.

Immigration

Immigration decreased somewhat sharply in February. The decrease cannot be attributed to Germany's abandonment of all restrictions to submarine destruction on Feb. 1, because, comparing January and February, there was a decrease of 11 per cent in the inward movement and a decrease of only 2 per cent in the outward movement. Since the statistics refer to arrivals and departures at our borders, restrictions would be felt sooner in the outbound than in the inbound movement. The net passenger movement, aliens and citizens, is shown below by monthly averages, with the precise movement in January and February of this year. In each case the figures represent an excess of arrivals:

Net Passenger Movement Per Month

Fiscal year 1913.....	62,684
Fiscal year 1914.....	57,255
Fiscal year 1915.....	9,770
Fiscal year 1916.....	11,428
July-December, 1916.....	23,879
January, 1917.....	17,773
February	13,103

The net result of the movement since the war started has been that, if the rate during the two years preceding be taken as normal, there has accumulated to March 1, 1917, a deficiency of 1,492,000 in our population. At 60,000 per month the net movement into the country should have been 1,920,000, whereas the actual movement has been only 428,000.

Of the aliens admitted the percentage of females has not increased materially. The percentage of females among immigrant aliens was 35 in the fiscal year 1914 and 42 in the eight months ended last February, while in non-immigrant aliens it changed from 33 to 36 per cent.

There has been no very great amount of change in the character of inbound or outbound movement, as to races or countries. The decreases in arrivals have been more or less uniformly distributed. There have been, of course, various irregularities. An instance may be cited, to show how little one may generalize from the detailed statistics. In the fiscal year ended June 30, 1916, the south Italian race showed 33,909 immigrant aliens admitted, against 68,981 emigrant aliens departed, whereas in the next eight months the condition was reversed, there being 32,069 immigrant aliens admitted and only 7,961 emigrant aliens departed.

There are no statistics up to date of non-emigrant aliens leaving, but presumably any who left for the purpose of fighting would regard themselves as emigrant rather than non-emigrant. Emigrant aliens leaving for the German Empire have been as follows:

Fiscal year 1914.....	5,136
Fiscal year 1915.....	1,419
Fiscal year 1916.....	439
Eight months to March 1, 1917....	274

One thing has stood out clearly in the statistics, that in time of war citizenship of the United States counts. Necessarily not all the aliens who become citizens remain in the country, while one cannot become a citizen until he enters it as an alien. Hence it is normal that more citizens leave the country than arrive. In the fiscal years 1913 and 1914 the excesses of departures of citizens were 61,098 and 82,211 respectively. In 1915 there was a rush of citizens back to the country, whereby the excess of arrivals was 67,167. By the next year the movement was nearly over, but even that year showed excess arrivals of 11,197. In the eight months ended February, 1917, 87,468 citizens arrived and 87,966 departed, showing a net exodus of 498. The statistics make plain that there has been no disposition on the part of naturalized citizens to return to the land of their birth in order to take up arms.

CORRESPONDENCE

The Question of Negro Labor

To the Editor: I have read the editorial in THE IRON AGE of April 12 entitled "Negro Labor in the North" and am glad to see that, as a whole, you have a good word for the negro. I was somewhat prejudiced up to the late eighties, when I took charge of an iron works in Georgia employing hundreds of men, among whom all the unskilled and semi-skilled were negroes. I soon found that to get these negroes to do a fair day's work, and do it cheerfully, it was only necessary to treat them right, whether at work or on the street. I never knowingly passed any I was acquainted with on the street without speaking during the 12 years I was in Georgia.

The housing question is somewhat of a problem, relative to the possible deterioration of property value where they congregate, but in comparison with housing some classes of European immigrants it sinks into insignificance. With few exceptions the negro is an American all through, and stands ready to fight for the country. Furthermore, he is determined to live as much as possible like the white working people, while, on the other hand, too many of the European immigrants have no idea of making this their permanent home, live continuously in the most congested and un-

sanitary manner, earn all they can but spend the least possible amount, and send or carry the remainder out of the country in which it is earned to enrich their own.

WILLIAM S. LUCKENBACH.

Philadelphia, April 13, 1917.

Metal Trades Meeting Next Week

Addresses by men of national prominence on topics of vital interest will be a feature of the convention of the National Metal Trades Association, to be held on Wednesday and Thursday, April 25 and 26, at the Hotel Astor, New York. At the session on Wednesday afternoon, the speakers and subjects are as follows:

"The Council for National Defense," by Howard E. Coffin, member of that body, and chairman of the industrial preparedness committee of the Naval Consulting Board.

"The Banker's Co-operation With Industry," by Ferdinand C. Schwedtmann, National City Bank, New York.

"National Industrial Conference Board," by William H. Barr, Lumen Bearing Company, and president National Founders Association.

"The American Institute of Weights and Measures," by Luther D. Burlingame, industrial superintendent, Brown & Sharpe Mfg. Company, Providence.

At the convention banquet on Wednesday evening, Prof. Jeremiah W. Jenks, New York University, William A. Prendergast, comptroller of New York City, and the Rev. J. Herman Randall, New York, will speak.

At the Thursday morning and concluding session, the subject of the merchant marine will be discussed by Wallace Downey, New York, and short business talks are to be given by A. L. Humphrey, president New York Air Brake Company, Pittsburgh; by George F. Steedman, Curtis & Co. Mfg. Company, St. Louis; by Frank A. Scott, Warner & Swasey Company, Cleveland, and recently appointed chairman of the general munitions board, created by the Council of National Defense, and by James T. McCleary, secretary American Iron & Steel Institute, New York.

In the opening session, on Wednesday morning, reports will be made on industrial education by F. A. Geier; on apprenticeship by W. A. Viall; on membership by John W. O'Leary, and on prevention of industrial accidents by F. E. McKee.

Tennessee Company Improvements

President George G. Crawford announces some Tennessee Coal, Iron & Railroad Company improvements as follows: "An additional heating furnace similar to the new heating furnace now in use, will be installed and other improvements made to the plate mill at Bessemer, Ala., with a view of increasing the production of steel plates. The Little Belle furnace at Bessemer will be remodeled to produce special iron for the Ensley works. The metal will be transported in molten state in 65-ton ladles. Improvements and additions to the new Bayview mine will be made with a view of increasing its capacity from 1500 to 2500 tons per day."

Sloss-Sheffield Beehive Ovens to Start

BIRMINGHAM, ALA., April 17, 1917—(By Wire).—The city of Birmingham has granted the Sloss-Sheffield Steel & Iron Company the right to relight its Beehive coke ovens at its city plant for three years, pending the building of a by-product plant at North Birmingham. This will greatly assist the company in its furnace operations.

The Bethlehem Steel Company's No. 5 blast furnace at Steelton, Pa., has again been put in operation after being out for several weeks for repairs. The entire plant of six furnaces will now be kept in as constant operation as possible, enabling previous production records to be surpassed.

The Peerless Drawn Steel Company, Massillon, Ohio, has established a Detroit office in room 1938 Penobscot Building, with L. H. Carlisle as district sales manager.

TO CONSIDER ORE RATE

Railroads Anxious to Know Plans of Blast-Furnace Owners

WASHINGTON, April 17, 1917.—At the solicitation of the railroads, the Suspension Board of the Interstate Commerce Commission will hold a hearing April 23, at 10 a. m. on their proposal to add 15 cents to ex-lake ore rates on and after May 1. While the rate regulating body has unofficial information as to the feeling of strong opposition with which the blast-furnace interests in the Mahoning and Shenango valleys regard the advance, it has thus far received but one formal protest, that of an iron and steel company at Columbus, Ohio, which has been getting ore from Toledo on a 50-cent rate.

The railroads are also aware of the strenuous objections of operators in the valleys and particularly the attitude of the Pittsburgh Steel Company, which complained against the existing rate as excessive and drew from the Commission a tentative report recommending that its plant at Monessen be taken from the Pittsburgh and placed in the Johnstown district. Were that report ever adopted, the result would be an increase in rates for the company that complained that existing charges were too high.

There has been some suggestion that the shippers may seek relief in the courts or by an appeal to Congress. It is therefore suspected the railroads asked for the hearing, which is technically known as a conference, with a view to learning, if possible, the plans of the most aggressive of the blast-furnace men.

W. L. C.

New Sheet Mill at Warren

A new sheet mill will be erected in Warren, Ohio, by Edward F. Clark of the Trumbull Steel Company and others interested in that company. A 100-acre site has been acquired west of the city, and it is stated that construction will be started shortly. The plant will be equipped with eight mills at the start. It is stated that the supply of steel bars will be furnished by the Trumbull Steel Company, which is building a new open-hearth steel plant, but otherwise there will be no connection with that company. Mr. Clark is a son-in-law of Jonathan Warner, president of the Trumbull Steel Company.

The new plant will be operated by the Liberty Steel Company, which has been organized with a capital stock of \$600,000 by Edward F. Clark, Albert Kenworthy, John W. Ford, H. D. Taylor and L. A. Manchester. It will have an annual capacity of 30,000 tons, mostly highly finished sheets for automobiles and metal furniture. Temporary offices will be opened in the Western Reserve Bank Building, Warren, Ohio.

One Wharton Furnace Started

One furnace of the Wharton Steel Company's group at Wharton, N. J., was blown in April 7 and the first cast, which was basic iron, was made on Monday, April 9. When the small amount of non-Bessemer ore which is on hand is used up the furnace will turn on to Bessemer iron. The second furnace will probably be blown in about May 1 and the third some time in May. Some considerable sales of Bessemer iron for export were made early in the year and domestic sales have been made recently.

Proposed Texas Shipyard

W. H. Grannis, 2320 Harlem Avenue, Baltimore, will start this week for Texas to organize a company to erect a shipbuilding plant at Orange, Tex., on the Sabine River, about 24 miles from the Gulf. The new company expects to build 1000-ton wooden vessels which can be used as barges, sailing vessels or auxiliaries.

According to an Ottawa announcement, the Dominion Steel Corporation has closed a contract with the Imperial Munitions Board for the entire steel output of the corporation for the first six months of 1918.

GARY ON WAR TAXES

Discusses Important Subjects at Corporation's Annual Meeting

The annual meeting of the United States Steel Corporation was held at its offices in Hoboken, N. J., Monday, April 16. Chairman E. H. Gary, who presided, stated that he estimated that the corporation's tax would amount to about \$43,000,000 more for the present year, if the Administration's war tax plans were adopted, than about \$65,000,000, the amount that would be paid this year not including the extra war tax, as compared with \$26,599,720 in 1916. Judge Gary said the corporation is supplying the Government with steel plates at \$2.90 per 100 lb. and is receiving \$3.50 to \$4 from the general trade, while it would be possible to sell at much higher figures. Answering John L. Osgood, a stockholder who desired information as to the probable effect of war conditions on the earnings of the corporation, Judge Gary said:

Effect of Proposed Laws

The laws already passed will increase the taxes of the corporation very materially. The laws which it is proposed to pass will increase our burden still further. I have made an estimate of the effect upon our corporation as to the increased taxes and calculate that it will be about \$43,000,000 a year. That other laws will be passed no one at the present time can doubt. The burden which will be imposed by the Government upon corporations and upon individuals no doubt will be very large. I am sure that no loyal citizen can object provided there is a fair and equitable distribution of the burden.

Those, I believe, are the questions which are in the minds of all good citizens. Not knowing what these laws will be, or how large the burden may be increased, of course it is impossible to state what will be the net result. If the disposition of the lawmakers shall be to secure as much money as can possibly be expended for all the purposes which have been suggested, then it seems evident that all the profits or earnings of all the corporations and all the individuals may be taken away from those who possess them. I do not believe that is going to be the attitude of the lawmakers. If the disposition will be only to secure such moneys as are absolutely needed for Governmental purposes, and the distribution of the burden is fair and equitable, it seems at the present time as though the earnings of the Steel Corporation would be very large this year.

Could Increase Earnings

If the corporation were disposed to take advantage of every opportunity that is offered the earnings could be very much larger at present. It has never been our intention or effort to secure the highest prices for our commodities. When prices naturally advance and when producers and sellers generally are taking advantage of the great demand which may come from time to time, it has been our effort to steady prices and keep them down within what we considered reasonable and fair limits.

When business is demoralized, and there is a rush on the part of producers and sellers to get rid of their commodities at any price, it has been our effort, so far as our influence goes, to steady prices and keep them from going to a point that is unreasonably below what would bring fair returns on our investment. We do that first, because we believe in protecting our employees and should be entitled to receive fair profits so as to enable us to take care of our employees, and so as to be able to keep our properties up to the very best condition. And second because we believe it better for every one interested in our work that prices and conditions should be kept stable.

Large Volume of Business

Referring to the heavy volume of business transacted by the Corporation Judge Gary said:

At present we have more unfilled orders on our books than ever. We have enough business to keep us busy for the whole year and have sold a great deal for 1918. We could sell much more if we had it to sell. It is very fortunate for us and our Government that we have as large a capacity as we have. I think the capacity of the United States Steel Corporation for finished steel is about as much, or perhaps larger, than the total capacity of all Germany and twice as much as England. We have, I presume, on the average 40 to 45 per cent of the total capacity of the United States. We have no desire or disposition and are making no effort to increase that percentage.

Judge Gary said the corporation and stockholders should take pride in the fact that from the beginning the company has been at peace with its employees; they now number approximately 270,000. He said the relations between the corporation and its employees are harmonious and satisfactory, though from time to time efforts had been made by outsiders to create dissension, but without success.

"If the corporation is given a fair chance and is treated by the ruling powers in accordance with its desires," resumed Judge Gary, "there seems to me no doubt that we will continue to be successful."

Dividend Fund Proposed

"Would it not be wise, owing to the current large earnings, to create a fund which would insure steadier payment of dividends?" asked a stockholder. To this Judge Gary answered:

A great deal of consideration has been given to that. We have made investments in securities that are A No. 1, that give us a large reserve, but the question as to whether we should put that money absolutely in a fund which could only be used for the payment of dividends is an open one which has two sides and has not been decided. It is very easy to imagine that if the corporation should put in a fund \$100,000,000, which would be a 5 per cent dividend on the common stock for four years, conditions might possibly arise where the corporation would regret that it held the money in that way, for the reason that it might be used to very greater advantage if not so held.

You know without my telling you that the corporation has a very large amount of cash and cash resources at this time. But who knows how much cash and expenditures we will need in the contest for supremacy in the trade, not only in this country but in competition with other countries? Who knows what additional mills we will have to build unless we lose our position? Who knows what the financial and commercial conditions in this country may be in the next few years?

E. R. Smith, a heater employed in one of the corporation's plants in Ohio, expressed appreciation of employees of the policy of the corporation toward the workingmen as to wages. He said there is a pronounced feeling of patriotism among the employees who will be loyal to the corporation during the present international crisis.

Robert Bacon, Samuel Mather, Thomas Morrison, John S. Phipps and Daniel G. Reid were re-elected directors.

The Webb Bill Coming Up Again

WASHINGTON, April 17, 1917.—The Senate Committee on Interstate Commerce has ordered a favorable report on the so-called Webb bill legalizing combinations of manufacturers and shippers designed to operate exclusively in the export trade. The bill, as agreed upon by the committee, is identical with the measure framed by the Senate Committee in the closing days of the last Congress and contains the so-called Pomerene amendments designed to safeguard the domestic trade from the restrictive influence of any export combination. It is being treated as a war measure at the direct instance of the President and it is believed will be enacted into law at the present special session.

W. L. C.

Eastern Bar-Iron Producers Establish Open Price Competition

Bar-iron producers of the East have organized the Eastern Bar Iron Institute to operate on the Eddy system of open price competition. An office will be established in New York City. E. M. Zehnder, president Scranton Bolt & Nut Company, is president; Frank G. Kennedy, Jr., president Logan Iron & Steel Company, Philadelphia, is vice-president, and Edward Ehlers, president Rockaway Rolling Mill, Rockaway, N. J., is treasurer.

Russia May Buy 40,000 Cars

A cable from Petrograd announces that the Russian Provisional Government has decided to place a contract in the United States for 40,000 railroad cars and 2000 locomotives, delivery specified for July, 1918.

New Malleable Castings Method

A new method of making malleable iron castings, doing entirely away with the air furnace practice, will be used in the plant now being built by the National Malleable Castings Company, Cleveland. The metal will be melted in a cupola and a portion of the melted charge, depending on the amount of carbon and other impurities to be removed (usually about one-fifth of the total), will then be run into a side-blow Bessemer converter, in which the carbon, manganese and silicon will be partially or wholly blown out. The treated metal is then combined in a ladle with the remainder of the metal from the cupola, and the charge is transferred to an electric furnace in which the refinement of the metal is completed. If more complete refinement is not required the metal may be cast without being subjected to the final refinement in the electric furnace. The melting equipment will consist of four 72-in. Whiting cupolas, Bessemer converters built by the company, and four 6-ton Heroult electric furnaces.

The method of pouring will also be a radical departure from the usual practice. Instead of pouring into small ladles, the metal will be poured from the electric furnaces into ladles of 12,000 to 14,000 lb. capacity, and carried a considerable distance with traveling cranes and poured into small ladles. From the latter the metal will be poured into the molds. This practice will necessitate the installation of a greater number of cranes than would otherwise be required. Twelve or 14 traveling cranes, up to 20-ton capacity, will be provided. The plant is expected to be ready for operation about Jan. 1, 1918. The method of melting and refining iron to be used was developed by W. J. Kranz, vice-president of the company.

New Installations of Heroult Electric Furnaces

Licenses have been granted by the United States Steel Corporation for the installation of the following Heroult electric steel furnaces:

The Bethlehem Steel Corporation, South Bethlehem, Pa., will install one 6-ton furnace for making projectiles from cold scrap. This company is now operating a 10-ton Girod furnace.

The General Motors Company, Detroit, Mich., will install two 6-ton furnaces for making steel castings. One of these will be located at the plant of the Samson Sieve Grip Tractor Company, Stockton, Cal., and the other furnace will be installed in a new plant to be built at Saginaw, Mich.

The Heppenstall Forge & Knife Company, Pittsburgh, Pa., will install one 6-ton furnace for making forging ingots. This company is already operating a furnace of the same size and type.

The Alaska Treadwell Gold Mining Company, Treadwell, Alaska, will install one 2-ton furnace for making steel castings from cold scrap.

The Timken-Detroit Axle Company, Canton, Ohio, will install one 2-ton furnace for making steel castings from cold scrap.

The installation of these six furnaces brings the total operating or contracted for in the United States and Canada to 120.

Wage Increase to Miners

Miners of bituminous coal in Illinois, Indiana, Ohio and western Pennsylvania, 250,000 in number, have been granted a wage increase of 20 per cent. The raise was agreed upon Tuesday by the Conference Committee of the Central Competitive Field, representing both operators and miners, which had been in session at the Hotel McAlpin, New York, since April 12. It is expected that the new wage will be adopted by operators throughout the United States. It would add \$100,000,000 a year to operating expenses and force up the price of coal.

Under the new agreement pick and machine mining is advanced 10c. a ton. Day laborers now receiving \$2.98 and \$3 in the mines are advanced to \$3.60, tappers are advanced to \$1.90 a day and boy workers from \$1.57 to \$1.90.

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Locomotive Orders

Orders for locomotives in the past two weeks have been 78. Of these, the American Locomotive Company will furnish 50 locomotives to the Canadian Government Railways, and the Baldwin Locomotive Works will build 16 for the Carolina, Clinchfield & Ohio, 7 for the Chicago & Eastern Illinois and 5 for El Paso & Southwestern. The Chicago, St. Paul, Minneapolis & Omaha is inquiring for 20 locomotives, and it is reported but not confirmed that the Russian Government is contemplating buying 2000 locomotives for delivery in July, 1918. Up to and including April 14 it is estimated that 136 locomotives have been ordered this month, bringing the total for the year to that date to 1474.

PERSONAL



J. E. OTTERSON

J. E. Otterson, recently appointed by the Council of National Defense a member of the Board of Experts whose duty it will be to standardize American munitions, is a graduate of the Naval Academy and has served as an officer in the Navy. He also graduated from Massachusetts Institute of Technology as a Master of Science, and took a course in naval architecture. He served as naval constructor in the United States Navy for a time, and is now first vice-president and general manager of the Winchester Repeating Arms Company, New Haven, Conn.

Dr. George K. Burgess, of the Bureau of Standards, Washington, is a member of a party of six American scientists who are on their way to England and France to co-operate with scientists in those countries in studying problems arising out of the war. He will make a study of metals suitable for guns and rigid dirigibles. The party was sent jointly by the Advisory Commission of the Council of National Defense and the National Research Council. The other members are the following: Dr. Joseph S. Ames, Johns Hopkins University, aeronautical conditions; Dr. Richard P. Strong, Harvard, camp sanitation; Dr. Linsley R. Williams, assistant health commissioner of New York State; George A. Hulett, Princeton, chemistry of explosives; Dr. Harry Fielding Reid, Johns Hopkins, scientific map making and photography from airplanes.

John Wheeldon, who has been connected with the American Steel & Wire Company for 27 years, for several years past having been superintendent of the Cuyahoga works in Cleveland, has resigned to become works manager of the Elyria, Ohio, plant of the Elyria Iron & Steel Company. Willis McKee, who has been superintendent at the Elyria plant, has been transferred to the Cleveland plant.

Ambrose N. Diehl, formerly assistant general superintendent of the Duquesne steel works of the Carnegie Steel Company, has been appointed assistant to William Wigham, vice-president, with offices in the Carnegie Building, Pittsburgh. S. G. Worton, formerly superintendent of the open-hearth department at the Duquesne works, has been appointed to succeed Mr. Diehl. R. B. Bostwick succeeds Mr. Worton. F. W. Underwood has been appointed superintendent of river transportation of the Carnegie Company. When its Koppers by-product coke ovens at Clairton, Pa., are finished, the company will bring coal in barges down the Monongahela River and Mr. Underwood will have charge of this and any other river transportation.

Five prominent shipbuilders have accepted membership on an advisory committee on naval architecture at the Massachusetts Institute of Technology, Cambridge, Mass. They are Joseph W. Powell, president Fore River Ship Building Corporation; Homer L. Ferguson, president Newport News Shipbuilding & Dry Dock Company; Charles P. Wetherbee, vice-president Bath Iron Works; James Swan, Herreshoff Mfg. Company, and George J. Baldwin, vice-president American International Company and president New York Shipbuilding Corporation.

R. T. Tinsley has been elected vice-president of the American International Corporation, while Cecil Page and Thomas W. Streeter have been chosen secre-

tary and treasurer respectively, to succeed Mr. Tinsley. R. B. Sheridan, president Allied Machinery Company, and Harris D. H. Connick, construction expert of the San Francisco Exposition, have been added to the list of vice-presidents. All other officers will hold over for the coming year.

Joseph G. Derricks, sales agent in the office of the American Steel & Wire Company, New York City, in charge of the manufacturing trade in the Eastern States, has resigned to become assistant general manager of sales of the Pittsburgh Steel Company, with offices in the Union Arcade Building, Pittsburgh. He has been connected with the wire trade in various capacities for about 28 years, for the last 15 years having been connected with the sales department of the American Steel & Wire Company.

Two sons of Paul Armstrong, Armstrong Brothers Tool Company, Chicago, who are juniors at the University of Illinois, have enlisted in the motor patrol service of the Government. When Mr. Armstrong was informed of the fact he ordered a 40-ft. patrol cruiser, which will be proffered to the Government.

Frank R. Bacon, president Cutler-Hammer Mfg. Company, Milwaukee, maker of electric controlling devices, has been commissioned a captain in the United States Quartermasters' Reserve Corps. The company supplies the army and navy with much material.

J. P. Van Gelder, Sydney, Australia, spent several days in the Milwaukee machinery trade last week for the purpose of placing orders for a varied assortment of tools for exportation to his country.

Frank K. Bull was re-elected chairman of the board of directors of the J. I. Case Threshing Machine Company, Racine, Wis., at the recent annual meeting. Other officers elected are: President and treasurer, Warren J. Davis; vice-presidents, E. J. Gittings and Milton H. Pettit; secretary, William F. Sawyer; assistant secretaries, Stephen Bull, 3d, and W. W. Ramsay; assistant treasurer, R. P. Howell and C. F. A. Dellschaft.

William A. Field, general manager United Alloy Steel Corporation, Canton, Ohio, has been elected president, and J. Howard Renshaw secretary of the Cincinnati Industrial Association, Cincinnati, has been elected secretary of the recently organized Canton Industrial Association, which will devote special attention to industrial welfare and social work among shop employees.

W. C. Woodland, chief engineer, Packard Electric Company, Warren, Ohio, has resigned and on May 1 will become consulting engineer of the Steere Engineering Company, Detroit, manufacturer of gas purification equipment.

The Braemer Air Conditioning Corporation, which was organized on Jan. 1 to take over the air conditioning department of Warren Webster & Co., Camden, N. J., has announced its organization, which has headquarters in the Lafayette Building, Philadelphia. William G. R. Braemer, for nine years in charge of the development of the Webster air washers and other air conditioning apparatus and previous to that nine years chief engineer of the Buffalo Forge Company, is president and general manager. Herbert Coward, formerly of the Buffalo Forge Company, is treasurer, and H. A. Terrell, who has been associated with Mr. Braemer, is secretary. The head of the engineering staff is E. Nesdahl, a mechanical engineer, as are the officers. L. D. Emmert is in charge of the Western territory, with headquarters at 1401 Marquette Building, Chicago.

J. G. Utz has been appointed chief engineer of the Standard Parts Company, Cleveland. He will have charge of research in connection with the company's chemical laboratories. He has been connected with some of the Detroit automobile companies and is a member of the Council and chairman of the General Standards Committee of the Society of Automobile Engineers.

OBITUARY

Frank S. Witherbee

Frank Spencer Witherbee died early Friday morning, April 13, at his home in New York City after a long illness, aged 65 years. Mr. Witherbee had not been in good health for several years, but not until recently was he compelled to retire from his many activities. The death of his only son several years ago at the age of 21 was a shock from which he never entirely recovered.

Mr. Witherbee was born in Port Henry, N. Y., May 12, 1852. After graduating from Yale in 1874 he made a trip around the world. At his father's death in 1875, he entered the firm of Witherbee, Sherman & Co., of which his father was one of the founders in 1849. He immediately took a deep interest in the business, that of iron mining in the Lake Champlain district, and displayed strong executive ability. His great uncle, S. H. Witherbee, and father, J. G. Witherbee, were for



FRANK S. WITHERBEE

years active in the company. The Lackawanna Steel Company purchased the Sherman interests in the early eighteen-nineties. Although the business was well established when Frank S. Witherbee became connected with it, he was very influential in bringing about the adoption of modern methods in the concentration of iron ore, which has been carried on by the firm very extensively during the past 10 years, and in magnetic separation to reduce phosphorus and in other ways improve the ore. In recent years, the production has been from 1,000,000 to 1,500,000 tons annually.

At an early age Mr. Witherbee became prominent in many phases of business, civic and social life and was active in numerous clubs, associations and directorates. He was for a time president of the Troy Steel Company, Troy, N. Y. During his incumbency of that position the company built a basic Bessemer plant. For a period just before the purchase of control by the Gates-Schley interests, he was first vice-president of the Tennessee Coal, Iron & Railroad Company, and at the time of his death was president of Witherbee, Sherman & Co., Inc., president of the Cubitas Iron Company, vice-president of the Cheever Iron Ore Company and president of the Lake Champlain & Moriah Railroad Company. He was a member of the New York Chamber of Commerce, the American Institute of

Mining Engineers, a member and director of the American Iron and Steel Institute, a member of the finance committee of the Equitable Life Assurance Society, and a director in several banks. In 1912 he was decorated with the insignia of Legion of Honor by the French Government in recognition of his services in connection with the Champlain Tercentenary. He never sought public office, but stood high in the councils of the Republican party, and served as national committeeman during the Harrison campaign.

Mr. Witherbee was a member of the Presbyterian Church at Port Henry and while in New York was a regular attendant at Grace Episcopal Church at which the funeral services were held Monday morning. Judge E. H. Gary, chairman of the Steel Corporation, and President E. A. S. Clarke of the Lackawanna Steel Company were among the pallbearers.

JAMES BUCHANAN BRADY, long an important factor in the railroad supply business and popularly known in New York as "Diamond Jim" on account of his remarkable fondness for diamonds, died April 13 at the Shelburne Hotel, Atlantic City, N. J., aged 62 years. He started in life as a messenger boy and in that way became acquainted with the late Charles A. Moore of Manning, Maxwell & Moore, who gave him a chance to sell hacksaws, and in a short time he became one of the most successful salesmen in the country. He transacted a very extensive business with the New York, New Haven & Hartford and other railroads and amassed a large fortune. He was one of the organizers of the Standard Steel Car Company and was vice-president of the company at the time of his death. He was also president of the Independent Pneumatic Tool Company, director of Manning, Maxwell & Moore, vice-president of the Keith Car Mfg. Company, vice-president of the Osgood-Bradley Car Company and director of the Consolidated Safety Valve Company and the Union Injector Company.

DR. RICHARD W. BOLAND, founder and for many years president of the Birmingham Machine & Foundry Company, Birmingham, Ala., died April 10 at El Paso, Tex., while on his way to California for his health. He sold out his business several months ago. He was a native of Ireland, but was reared and educated in Philadelphia. After practising medicine a short time he went into the machinery manufacturing business in Philadelphia, then in New Orleans and went to Birmingham 30 years ago. He was a pioneer in developing Birmingham's sugar house machinery trade with Cuba and other sugar growing countries. He leaves his widow.

GEORGE H. SARGENT, president of Sargent & Co., New Haven, Conn., ranking among the largest manufacturers of general hardware in the world, died April 14 at his home in New York City, aged 89 years. He was born in Leicester, Mass., in 1828, and was graduated from Harvard in 1853, in the class with Charles W. Eliot, ex-president of the university. He removed to New York about 60 years ago and went into the hardware business with an older brother. He participated actively in the conduct of the business until a short time before his death. He was a member of the Union League and Hardware clubs, and leaves a married daughter.

FRANKLIN ROCKEFELLER, youngest brother of John D. Rockefeller, died at his home in Cleveland April 15, aged 72 years. He was vice-president of the Cleveland Steel Company, Cleveland, and of the Buckeye Steel Castings Company, Columbus, Ohio. At one time he was associated with the late James Corrigan in the ownership of iron-ore mines in the Lake Superior district. He retired from business several years ago.

CHARLES S. BONNEY, inventor and mechanical expert, with a record of more than 60 patents on various types of machines, died April 9 of pneumonia in his 90th year, at the home of his daughter, Mrs. Ella N. Rapp, 66 Newton Place, Irvington, N. J. He was a native of Penn Yan, N. Y., and located in Newark about 25 years ago. His wife, three sons and two daughters survive.

Iron and Steel Markets

THE COURSE OF PRICES

Effect of Government and Other War Influences

Advance in Pig Iron Halted—Activity in Rails—Expediting Allies' Steel

The steel trade is looking more closely into the influences the war situation has set in motion that will hold prices in check. The ultimate result of the concessions made to the Government is being considered; also the effect of the fixing by the Government of prices on certain contracts which mean a loss to those who take them unless they can get steel products at less than to-day's prices.

The market itself has given no sign in the past week of turning away from the long round of price advances. Domestic buying in some lines is less than in March and buyers are showing their perplexity. But most forms of steel are just as difficult to get and there is still the unknown factor of the extent to which consumers in ordinary channels must stand aside for the wants of the Government and its allies.

An advance of \$6 per ton on wire products by a leading independent company, one of 10 to 15 per cent in nuts and bolts, and some raising of scrap prices at Chicago, with a decline of \$2 to \$3 a ton on heavy melting steel scrap at Pittsburgh, are the week's main changes in prices.

The leading wire producer has been indisposed to go beyond the prices made by the \$4 advance of March 5 and has not yet done so. In some other lines, however, Steel Corporation advances have heretofore come closely on the heels of those made by independents.

The variations in prices asked by different manufacturers and by the same manufacturer to different buyers or classes of buyers are more striking on the present high levels. Buyers are making the most of any connection they may have with a Government contract to get special treatment, in deliveries or prices, or both. Producers are expediting shipment of material for Government work, taking pains to sift out the exact tonnage to be so applied, but are not yet responsive to appeals for lower prices to private works, seeing that in nearly every case another buyer stands ready to pay more. In some cases where shell steel is involved the Government will do the buying, the munitions plant concerning itself only with the finishing.

Government influence is being exerted to hurry deliveries to the Entente Allies and the request has been made that their wants have precedence over those of the Government itself.

A late move by the Ford Motor Company throws sheet market conditions into strong relief. This company has bought a total of 6000 tons of sheet bars in the past week and has arranged with a mill to roll these into sheets to supply its plant. Sheet mills which also produce tin plates are putting steel into the latter under Government urging that canners be especially looked after, and the result is a

tightening sheet market. As high as 9c. has been paid for No. 28 galvanized sheets. Contract tin plates sell easily at \$8 per box and \$9 has been paid for 1000-box lots.

Rails are again active. Two lots for France of 20,000 tons each have been taken for rolling in the fourth quarter of 1918. Italy has bought 15,000 tons. The Northern Pacific placed 40,000 tons for the last quarter of next year, and from other lines inquiry for several hundred thousand tons has come up, largely for delivery late in 1918 and early in 1919. Chicago mills alone have 165,000 tons before them.

Some substitution may yet be made on foreign contracts for shell steel placed last year. On two orders, for 20,000 tons and 25,000 tons a month, respectively, placed in the Central West, it is intimated that some plates, structural shapes, or bars may be taken, indicating a beginning of calculations on the ending of the war.

The great impetus given all over the country to working the soil has already been felt in additional inquiry for steel from implement manufacturers.

Japan with difficulty has secured 4000 tons of ship plates for this year, paying 7¼c. to 8c., and has also taken 1500 tons of shapes. Italy is in the market for 5000 tons of annealed wire.

The pig-iron advance has halted—whether for long remains to be seen. An Eastern steel company has taken 12,000 tons of Bessemer iron at \$40 at furnace, though \$42 at Valley furnace has been paid in the Central West. For third quarter delivery 18,000 tons of basic iron has been bought in northern Ohio at \$40.50 delivered, 10,000 tons coming from Chicago.

Some resale foundry iron has held prices in check in one or two Northern markets. Of the Southern accumulation of warrant iron some large lots remain, and free stocks in Alabama yards are still considerable, but \$35 is freely paid for this year's iron.

The spot coke price has eased off in the past week to \$7.50, Connellsville district.

Pittsburgh

PITTSBURGH, PA., April 17, 1917.

A meeting of leading ore and coal producers and railroad officials is being held in this city to devise ways and means of securing a better supply and movement of cars, particularly in making coal shipments to the Northwest. It is the idea of the ore, coal and railroad interests to work together to secure maximum efficiency and thereby aid the Government in getting quick movement of cars containing basic materials needed in warfare. The ore season will open shortly, and, with the Northwest practically bare of coal, there is going to be great trouble not only in mining ore, but in moving it to upper Lake docks when the ore season opens. The local market on pig iron, semi-finished steel, and finished materials has not shown much change, but the chances favor higher prices on Bessemer and basic pig iron. The only advances in the week were on nuts and bolts, which are 10 to 15 per cent higher, although one leading maker has advanced wire products \$6 per ton effective from April 17. A general advance on wire products is now looked for. The supply of cars is

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	April 18, 1917.	April 11, 1917.	Mar. 21, 1917.	April 19, 1916.
No. 2 X, Philadelphia...	\$42.00	\$41.00	\$39.00	\$20.50
No. 2, Valley furnace...	40.00	40.00	37.00	18.50
No. 2 Southern, Cin'tl...	37.90	37.90	32.90	17.90
No. 2, Birmingham, Ala...	35.00	35.00	30.00	15.00
No. 2, furnace, Chicago*	39.00	39.00	37.00	19.00
Basic, del'd, eastern Pa...	38.00	38.00	35.00	20.50
Basic, Valley furnace...	40.00	40.00	32.00	18.00
Bessemer, Pittsburgh...	42.95	42.95	37.95	21.95
Malleable Bess., Ch'go*	39.00	39.00	37.00	19.50
Gray forge, Pittsburgh...	38.05	37.95	32.95	18.70
L. S. charcoal, Chicago...	41.75	38.75	36.75	19.75

Rails, Billets, etc., Per Gross Ton:	April 18, 1917.	April 11, 1917.	Mar. 21, 1917.	April 19, 1916.
Bess. rails, heavy, at mill	38.00	38.00	38.00	28.00
O.-h. rails, heavy, at mill	40.00	40.00	40.00	30.00
Bess. billets, Pittsburgh...	75.00	75.00	65.00	45.00
O.-h. billets, Pittsburgh...	75.00	75.00	65.00	45.00
O.-h. sheet bars, P'gh...	77.50	77.50	65.00	45.00
Forging billets, base, P'gh	100.00	100.00	90.00	68.00
O.-h. billets, Phila...	75.00	70.00	65.00	50.00
Wire rods, Pittsburgh...	85.00	85.00	85.00	60.00

Finished Iron and Steel,

Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia...	3.659	3.659	3.659	2.659
Iron bars, Pittsburgh...	3.50	3.50	3.50	2.50
Iron bars, Chicago...	3.25	3.25	3.00	2.35
Steel bars, Pittsburgh...	3.75	3.75	3.75	3.00
Steel bars, New York...	3.919	3.919	3.919	3.169
Tank plates, Pittsburgh...	6.00	5.75	5.25	3.75
Tank plates, New York...	6.169	5.919	5.419	3.919
Beams, etc., Pittsburgh...	4.00	3.75	3.75	2.60
Beams, etc., New York...	4.169	3.919	3.919	2.769
Skelp, grooved steel, P'gh	5.25	5.25	3.50	2.35
Skelp, sheared steel, P'gh	5.50	5.50	3.75	2.45
Steel hoops, Pittsburgh...	4.25	4.25	4.00	3.00

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, P'gh	5.75	5.50	5.00	2.85
Sheets, galv., No. 28, P'gh	7.50	7.25	7.00	5.00
Wire nails, Pittsburgh...	3.20	3.20	3.20	2.40
Cut nails, Pittsburgh...	3.75	3.75	3.70	2.60
Fence wire, base, P'gh...	3.15	3.15	3.15	2.25
Barb wire, galv., P'gh...	4.05	4.05	4.05	3.25

Old Material, Per Gross Ton:

Iron rails, Chicago...	\$32.00	\$31.00	\$28.00	\$18.00
Iron rails, Philadelphia...	31.00	31.00	28.00	20.00
Carwheels, Chicago...	24.00	24.00	21.00	14.00
Carwheels, Philadelphia...	26.00	25.00	22.50	17.50
Heavy steel scrap, P'gh...	27.00	30.00	22.00	17.75
Heavy steel scrap, Phila...	25.00	25.00	24.00	18.00
Heavy steel scrap, Ch'go...	27.50	27.00	24.50	16.50
No. 1 cast, Pittsburgh...	24.00	24.00	21.00	16.00
No. 1 cast, Philadelphia...	27.00	26.50	23.00	18.00
No. 1 cast, Ch'go (net ton)	20.75	20.25	17.25	12.75
No. 1 RR. wrot, Phila...	36.00	35.00	32.00	23.50
No. 1 RR. wrot, Ch'go (net)	30.00	29.50	27.00	17.00

Coke, Connellsville, Per Net Ton at Oven:

Furnace coke, prompt...	\$7.50	\$8.00	\$8.50	\$2.25
Furnace coke, future...	8.00	8.00	7.00	2.50
Foundry coke, prompt...	9.50	10.00	10.50	3.50
Foundry coke, future...	9.00	9.00	7.50	3.25

Metals,

Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York...	30.50	33.00	36.00	28.75
Electrolytic copper, N. Y.	30.50	33.00	36.00	28.50
Spelter, St. Louis...	9.50	10.00	10.37½	19.00
Spelter, New York...	9.75	10.25	10.62½	19.25
Lead, St. Louis...	9.20	9.15	9.37½	7.62½
Lead, New York...	9.40	9.35	9.50	7.75
Tin, New York...	55.25	54.62½	56.00	51.00
Antimony (Asiatic), N. Y.	34.50	36.00	32.00	41.00
Tin plate, 100-lb. box, P'gh.	\$8.00	\$8.00	\$8.00	\$4.50

better than for a long time, and shipments this month, both on ingoing and outgoing materials, will be larger than in March. The better supply of cars has brought about lower prices on prompt furnace coke. Prices on heavy steel scrap are lower, the Carnegie Steel Company now being out of the market. It is known that negotiations for large quantities of war steel are on between the Government and local steel mills.

Pig Iron.—There have been more actual sales of Bessemer iron at \$42 and of basic and No. 2 foundry at \$40, with chances favoring Bessemer and basic being higher, possibly before this week is out. The market seems to be almost bare of Bessemer and basic, particularly for early shipment. We note sales of 5000 to 6000 tons of No. 2 foundry for fourth quarter of this year and first quarter of next at \$40, Valley furnace. One consumer is reported to have bought 6000 tons of No. 2—1000 tons per month, over the last half of this year—at \$40, Valley furnace. We also note sales of 3000 tons, 2000 tons, and 1500 tons of Bessemer for delivery in second and third quarters at \$42, Valley furnace, and 1500 tons of malleable Bessemer for third quarter at \$40, Valley furnace. Some sellers are quoting \$45 at furnace for Bessemer, and will not shade that price. We quote: Standard Bessemer iron, \$42; basic, \$40; No. 2 foundry, \$40; malleable Bessemer, \$40, and gray forge, \$38, all at Valley furnace. The freight rate for delivery in the Cleveland and Pittsburgh districts is 95c. per ton. We also note sales of 12,000 to 15,000 tons of basic iron for second and third quarter delivery, all at \$40, Valley furnace. The Canadian Steel Corporation, Ltd., is in the market for 10,000 tons of basic iron, but has not secured any in this district. It is said to have bought about 3000 tons of off-basic in the Buffalo district.

Billets and Sheet Bars.—Late last fall large contracts for steel were made by the Entente Allies with local and Youngstown mills for delivery over all of this year. One Youngstown mill took a contract for 20,000 tons per month, and another a contract for 25,000 tons per month for delivery over all of this year. These contracts contained a clause to the effect that

the buyers had the option, if they so desired, to substitute other forms of steel, such as structural shapes, steel plates, or bars, for any unshipped portions of the shell steel called for in the contracts. It is understood that with several of the steel mills the buyers have taken up the question of canceling the shell steel and taking out other products. The prices charged for the other products, if they are taken, are to be those in effect at the time the contracts for the shell steel were made, and would therefore be somewhat lower than are in effect now. Not much is doing in the way of sales of billets and sheet bars. Consumers are getting fairly good shipments on their regular contracts, and the mills are having practically no surplus steel to sell in the open market. We quote soft Bessemer and open-hearth billets and sheet bars at \$75 to \$80 per ton, maker's mill, Pittsburgh or Youngstown; forging billets, \$100 to \$110 for sizes up to but not including 10 x 10 in., and for carbons up to 0.25.

Ferroalloys.—Prices on domestic ferromanganese are moving up rapidly. A sale of two cars for prompt shipment is reported at \$400, delivered. An option of 200 tons at the same price is likely to be exercised. New inquiry is quiet, consumers being pretty well covered. Three or four large cargoes of foreign 80 per cent have lately come in at New York and Baltimore, and the delivery of these cargoes to consumers has relieved the situation a good deal. However, higher prices are predicted for domestic ferromanganese, and it is claimed it may go to \$500 per ton. Sales of small lots of 50 per cent ferrosilicon are said to have been made at \$275 to \$300 per ton, delivered. We quote 18 to 22 per cent spiegeleisen at \$75 to \$80 and 25 to 30 per cent at \$85 to \$90, delivered. We quote 9 per cent Bessemer ferrosilicon at \$59; 10 per cent, \$60; 11 per cent, \$62; 12 per cent, \$65; 13 per cent, \$70; 14 per cent, \$75; 15 per cent, \$80; and 16 per cent, \$85. We quote 7 per cent silvery iron at \$46 to \$47; 8 per cent, \$47 to \$48; 9 per cent, \$49 to \$50; 10 per cent, \$50 to \$51; and 11 and 12 per cent, \$52 to \$53, all f.o.b. at furnace, Jackson or New Straitsville, Ohio, and Ashland, Ky., these furnaces having uniform freight rates

of \$2 per gross ton for delivery in the Pittsburgh district.

Structural Material.—The new inquiry is heavier, and some large jobs are under way. The McClintic-Marshall Company has taken 1500 tons for the new Frank Seder building, in this city, and 5000 tons for a crane runway at the Norfolk Navy Yard. The American Bridge Company has taken 5000 tons for a Government gun shop at Washington, D. C., and about 3500 tons for electrical and machine shops at League Island Navy Yard. It is said the structural steel for the new armor-plate and projectile plant at Charleston, W. Va., will be specified for in the near future. The Firestone Tire & Rubber Company, Akron, Ohio, is in the market for 2500 tons of structural steel for a new power house. We quote beams and channels up to 15-in., aside from Government orders, at 3.60c. to 3.75c. for extended delivery, and small lots from warehouse at 4.25c. to 5c., depending on quantity.

Plates.—There is no abatement in the demand for plates with the exception that steel car companies, which are not getting any new orders for cars, are not in the market, but this is more than offset by the heavier demand on the plate mills from shipyards, and also by the abnormally heavy export demand. Most plate mills have their output sold up for a year, and some of the smaller mills, that can ship out in three or four months, are quoting 5.50c. to 6c. at mill for $\frac{1}{4}$ -in. and heavier plates. Ship plates are quoted from 8c. to 9c. at mill. Small lots of $\frac{1}{4}$ -in. and heavier plates from warehouse continue to bring 6.50c. to 7c. and higher. It is said that more than one emergency lot of sheared plates for prompt shipment has sold at close to or all of 10c. per lb. at shipping point.

Sheets.—The new demand for all grades of sheets is much beyond the ability of the mills to supply, even when operating at maximum capacity. There has been a decrease in output of three or four of the largest sheet makers, due to the fact that they also make tin plate, and have been operating their tin-plate mills to as full capacity as possible, at the expense of the sheet department. One leading maker has been operating its three sheet mills to only partial capacity for some time, having largely sold its output of open-hearth steel on export orders. It is likely the output of sheets will be still further decreased as the tin-plate mills have been asked by the Government to give preference to tin-plate output as much as possible. Prices of the American Sheet & Tin Plate Company on No. 28 Bessemer black are 5.50c., and on No. 28 galvanized 7c. Most mills are quoting higher prices. It is said that small lots of No. 28 Bessemer black sheets for prompt shipment have sold at 6.50c. to 7c. at mill. We quote blue annealed sheets, Nos. 3 to 8, at 4.95c. to 5.50c.; box annealed, one pass Bessemer, cold rolled, No. 28, 5.75c. to 6.25c.; No. 28 galvanized, 7c. to 7.50c.; No. 28 black plate, tin-mill sizes, 5.75c. to 6c., all f.o.b. mill, Pittsburgh. These prices are for carloads and larger lots, for forward delivery. For prompt delivery, premiums of \$5 to \$10 per ton, or more, have been paid over these prices.

Tin Plate.—The Government has requested makers of tin plate and sheets to give preference to the production of tin plate for packers in order to conserve the food supply as much as possible. The makers will carry out this request as far as they can. The committee from the tin-plate manufacturers, consisting of J. I. Andrews, American Sheet & Tin Plate Company; E. R. Crawford, McKeesport Tin Plate Company, and E. T. Weir, Phillips Sheet & Tin Plate Company, is in Washington to-day conferring with the Government officials in regard to the tin-plate situation, and as to how the output can be increased. War contracts for both sheets and tin plate are also under discussion between this committee and Government officials. The famine in the supply of tin plate is serious, and higher prices are certain for canned goods this summer. The export demand for tin plate is still heavy, but practically all domestic makers are refusing to quote and are conserving their output for domestic trade. We quote tin plate, 14 x 28, at \$7.50 to \$7.75 per base

box for last half of the year delivery. On small current orders mills are quoting \$8 to \$8.25 for primes and wasters, per base box, at mill. We quote long-terne plate, No. 28 gage base, at \$7 to \$7.25; short-terne plate, \$11.50 to \$12, makers' mill, prices depending on quantities and deliveries wanted. The full schedule of prices adopted by the American Sheet & Tin Plate Company on terne plates is as follows: 8-lb., 200 sheets, \$14 per package; 8-lb., 214 sheets, \$14.30 per package; 12-lb., I. C., \$15.25 per package; 15-lb., I. C., \$15.75 per package; 20-lb., I. C., \$16.50; 25-lb., I. C., \$17.25; 30-lb., I. C., \$18; 35-lb., I. C., \$18.75; 40-lb., I. C., \$19.50.

Steel Rails.—Nothing is doing in standard sections except small current orders, which the mills are taking with the promise of the best delivery they can make, which, of course, will be very indefinite. The demand for light rails is active, and comes not only from the coal interests but from other consumers as well. The Carnegie Steel Company is sold up for many months on both standard sections and light rails, and most other makers are in the same condition. We quote angle bars at 2.75c. at mill, when sold in connection with orders for standard section rails, and on carload and smaller lots, 3c. to 3.25c. at mill. We quote light rails as follows: 25 to 45 lb., \$55; 16 to 20 lb., \$56; 12 and 14 lb., \$57; 8 and 10 lb., \$58; in carload lots, f.o.b. mill, with the usual extras for less than carloads. Standard section rails of Bessemer stock are held at \$38, and open-hearth \$40, per gross ton, Pittsburgh.

Iron and Steel Bars.—The demand for iron and steel bars is still abnormally heavy. All the mills are back in deliveries, some from 8 to 10 weeks, and others up to three months or longer. The larger consumers of steel bars are specifying heavily, and, while shipments are larger now than for some months, mills are not catching up on deliveries to any extent. The heavy advance in prices of gray forge pig iron is likely to bring higher prices on iron bars in the near future. We quote steel bars at 3.35c. at mill, with no promise of definite delivery, and 3.50c. to 3.75c. for shipment in two to three months. We quote refined iron bars at 3.50c., and railroad test bars 3.65c. at mill in carload lots.

Hoops and Bands.—Most consumers are covered over the second and third quarters on both hoops and bands, and some of the largest trade over the entire year. The nominal price of the Carnegie Steel Company on steel bands remains at 3.35c., but with no promise of delivery. Other makers are quoting 3.50c., and in small lots, up to 3.75c. at mill. Steel hoops are 4c. to the large trade, up to 4.50c. at mill, prices depending on the quantity and delivery wanted.

Shafting.—The large trade is covered through the third quarter, and in a few cases over the last half of this year. On the smaller sizes of shafting, say 1 $\frac{1}{2}$ -in. and 3-in. rounds, most makers can ship out in about eight weeks on new orders, but on hexagons and squares deliveries are no better than four or five months. The Government is reported to have placed some fairly large orders for shafting with local makers. Discounts range from 10 to 15 per cent off list, depending on quantity and delivery wanted.

Railroad Spikes and Track Bolts.—Little new inquiry is coming out for spikes, railroads being well covered over the remainder of this year, and specifications are not heavy. The demand for track bolts is reported strong, and prices are firm. We quote track bolts with square nuts at 5.35c. to 5.50c. to railroads and 5.50c. and up to 7c. and 8c. in smaller lots for prompt shipment. Railroad spikes, 9/16 in. and larger, are \$3.65, base; 7/16 and $\frac{1}{2}$ in., \$3.75, base; 5/16 and $\frac{3}{8}$ in., \$4, base. Boat spikes are \$3.90, base, all per 100 lb., f.o.b. Pittsburgh.

Wire Products.—Effective Tuesday, April 17, the Youngstown Sheet & Tube Company announced an advance of \$6 per ton on all wire products, but no other makers have yet taken this action, although likely to do so shortly. The demand for wire and wire nails is abnormally heavy. The mills are scrutinizing new orders carefully, and will quote only on specific orders to regular customers. Premiums over regular prices on wire nails and wire are readily paid, if mills will

promise reasonably prompt shipment. Export inquiry is heavy, but mills are turning these down, saying they desire to take care of domestic customers first. General prices are as follows: Wire nails, \$3.20 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails, taking an advance over this price of \$2 and shorter than 1 in., \$2.50. Bright basic wire is \$3.25 per 100 lb.; annealed fence wire, Nos. 6 to 9, \$3.15; galvanized wire, \$3.85; galvanized barb wire and fence staples, \$4.05; painted barb wire, \$3.35; polished fence staples, \$3.35; cement-coated nails, \$3.10 base, these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 51 per cent off list for carload lots, 50 per cent off for 1000-rod lots, and 49 per cent off for small lots, f.o.b. Pittsburgh.

Wire Rods.—The demand is still much beyond the supply, and higher prices are likely. Wire mills are increasing as much as possible their output of wire and wire nails, and this is taking up more and more their output of rods, so that the quantity they have to sell in the open market is getting steadily less. Quite large shipments of wire rods are being made to Canada, but these are on contracts taken some time ago. Local makers of rods say they are turning down export inquiry, as they do not have the rods to spare, even at the attractive prices offered. We quote soft Bessemer and open-hearth rods to domestic consumers at \$85. We quote high carbon rods made from ordinary open-hearth steel at \$90 to \$100, and special steel rods, with carbons in these running from 0.75 to 0.90, at \$100 to \$115 at mill. Heavy shipments of rods are being made into Canada on contracts taken some time ago.

Cold-Rolled Strip Steel.—The new demand is only fairly heavy, as most consumers are covered through the second quarter, and a few of the larger consumers over the third quarter. Makers have not yet opened their books for the last half of this year, and probably will not do so for some time. For second-quarter delivery we quote cold-rolled strip steel at \$7 to \$7.25 per 100 lb. on current orders. For reasonably prompt shipment mills are getting \$7.25 to \$7.50 and higher. Terms are 30 days net, less 2 per cent for cash in 10 days, delivered in quantities of 300 lb. or more when specified for at one time.

Nuts and Bolts.—Effective Thursday, April 12, makers advanced prices on nuts and bolts from 10 to 15 per cent. The new demand is reported heavy and best deliveries are in about 8 to 10 weeks or longer. The new discounts in effect are as follows, delivered in lots of 300 lb. or more, when the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent for cash in 10 days:

Carriage bolts, small, rolled thread, 40 per cent; small, cut thread, 35 and 2½ per cent; large, 25 per cent.

Machine bolts, h. p. nuts, small, rolled thread, 40 and 10 per cent; small, cut thread, 40 per cent; large, 30 per cent.

Machine bolts, c. p. c. and t. nuts, small, 30 per cent; large, 20 per cent. Bolt ends, h. p. nuts, 30 per cent; with c. p. nuts, 20 per cent. Lag screws (cone or gimlet point), 45 per cent.

Nuts, h. p. sq., blank, \$2.10 off list, and tapped \$1.90 off; hex., blank, \$1.90 off and tapped \$1.70 off; nuts, c.p.c. and t. sq., blank, \$1.70 off, and tapped, \$1.50 off; hex., blank, \$1.60 off, and tapped \$1.40 off. Semi-finished hex. nuts, 50 and 10 per cent. Finished and case-hardened nuts, 50 and 10 per cent.

Rivets 7/16 in. in diameter and smaller, 40 per cent.

Rivets.—The demand continues heavy. An advance of \$3 per ton has been made for delivery from July 1 to Oct. 1. We now quote button-head structural rivets, ½ in. in diameter and larger, \$4.75 per 100 lb., base, and conehead boiler rivets, same size, \$4.85 per 100 lb., base, f.o.b., Pittsburgh. These prices are only for delivery up to July 1. Terms are 30 days net, or ½ of 1 per cent off for cash in 10 days.

Wrought Pipe.—Heavy inquiries for line pipe are in the market—one for 60 miles of 8-in., another for 200 miles of 4-in., and other smaller inquiries—but mills are turning these away, as their output is sold up for this year, and they have orders on their books

for early 1918. On butt-weld pipe makers are not taking on any new customers, but are quoting only to regular trade for specific work, and can make deliveries in about eight weeks. Discounts on iron and steel pipe are given on another page.

Boiler Tubes.—Makers of iron and steel tubes are sold up for the year, or more, and are not quoting on new orders. Some mills have large contracts for both iron and steel tubes for delivery in the first half of 1918. Discounts on iron and steel tubes are given on another page.

Coke.—Due to a better supply of cars, blast furnaces are getting shipments of coke more promptly, with the result that the new demand is less and prices are weaker. Late last week there were sales of high-grade furnace coke at \$8 per net ton at oven, but there would be no trouble now in buying at \$7.50 and perhaps as low as \$7. There is not much demand for prompt foundry coke and it is also weaker. Several large consumers of foundry coke are covered over the last half of the year at not over \$9 at oven. Negotiations are on for upward of 40,000 tons of furnace coke per day; the producers are asking \$8, but as yet no contracts have been closed. We quote best quality furnace coke for prompt shipment at \$7.50 to \$8 per net ton at oven; best grades of 72-hr. foundry coke, \$9 to \$9.50, and on contracts for last half of the year, \$9. The Connellsville *Courier* gives the output of coke in the Upper and Lower Connellsville regions, for the week ended April 7, as 379,039 net tons, an increase over the previous week of 8249 tons.

Old Material.—The new demand has quieted down very much. The Carnegie Steel Company is now offering only \$27 delivered, Munhall, Pa., for best quality heavy melting steel scrap, but so far as known has not secured any at that price. An embargo will shortly be declared to a very important consuming point, and this is throwing much steel scrap on the market, making prices weak and lower. Several sales of 2000 and 3000 ton lots were reported at \$28 last week, but there would be no trouble in buying selected steel scrap at \$27, delivered. The market on other grades is fairly strong, but there has been little buying in the past week. We note a sale of 400 tons of billet and bloom crop ends at \$37.75, delivered consumer's mill, Pittsburgh. Prices for delivery in Pittsburgh and at other consuming points that take Pittsburgh freight rates, per gross ton, are nominally as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen, Midland and Pittsburgh, delivered.....	\$27.00 to \$28.00
No. 1 foundry cast	24.00 to 25.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	34.00 to 35.00
Hydraulic compressed sheet scrap....	22.00 to 23.00
Bundled sheet scrap, sides and ends, f.o.b. consumers' mills, Pittsburgh district	19.00 to 20.00
Bundled sheet stamping scrap.....	17.00 to 18.00
No. 1 railroad malleable stock.....	26.00 to 27.00
Railroad grate bars	15.00 to 16.00
Low-phosphorus melting stock.....	38.00 to 39.00
Iron car axles	45.00 to 46.00
Steel car axles	45.00 to 46.00
Locomotive axles, steel	50.00 to 52.00
No. 1 busheling scrap	21.00 to 22.00
Machine-shop turnings	13.75 to 14.25
Old carwheels	25.00 to 26.00
Cast-iron borings	14.50 to 15.00
Sheet-bar crop ends	33.00 to 34.00
No. 1 railroad wrought scrap.....	31.00 to 32.00
Heavy steel axle turnings.....	18.00 to 18.50
Heavy breakable cast scrap.....	22.00 to 22.50

On May 1 the offices of the Pittsburgh Forge & Iron Company will be removed from Tenth Street and Penn Avenue to 1305-1307 Chamber of Commerce Building, Pittsburgh.

The offices of C. M. Wolff, general agent of the Hostetter-Connellsville Coke Company, have been removed from 1212 Carnegie Building to 521 Union Arcade Building, Pittsburgh.

The general offices of the Pittsburgh Steel Company have been removed from the Frick Building to the new Union Arcade Building, Pittsburgh.

Chicago

CHICAGO, ILL., April 17, 1917.

Except in bolts and nuts, there has not been any generally accepted advance in steel products, although prices are harder and the premiums asked are stronger. Prominent mills hereabouts have as yet received no direct intimation as to what the Government will require of them, although in one or two instances individual buyers have informed them that certain materials were wanted for Government purposes. Unless the Government makes it clear that it wishes these private buyers to be cared for with all possible expedition, it is likely that contract customers will be preferred. Several manufacturers are inserting in their contracts a clause to the effect that the Government had a prior claim on the material purchased, and that delivery may depend thereon. Meanwhile so much uncertainty prevails as to the future cost of raw materials and the supply of labor, that manufacturers admit themselves to be much in the dark, and only able to proceed from day to day. It is estimated that the aggregate of inquiries for standard section rails for delivery in late 1918 or early 1919 is 165,000 tons. Alabama and Virginia pig iron is higher, but in these, as in most commodities, prices show considerable range. A large producer of Virginia iron has withdrawn entirely from the market, except for second-quarter delivery, and for this position \$40, furnace, is asked for any grade.

Pig Iron.—The general trend of the market is without change, with prices showing a stronger tendency, additional brands withdrawn, and inquiry lively especially for the last half. The scarcity of iron which exists all over the country is indicated by the fact that local interests have inquiry for several thousand tons for shipment to the East. Northern No. 2 foundry, malleable Bessemer and basic, first-half delivery, are still quoted at \$39, furnace, but are stronger at that level than a week ago. Alabama iron is exceedingly scarce at \$35, Birmingham, or \$39, delivered in the last half, although one maker has November and December iron for which \$34, Birmingham, or \$38, delivered, would be accepted. The leading producer of Virginia iron has withdrawn all brands for the last half of this year and first half of 1918, and is offering second quarter only, the quotation being \$40, furnace, for any grade, No. 2 plain and up. One of its brands takes a freight rate to Chicago of \$3.25, and others take \$3.34. Some business in Northern iron is being done at \$35, furnace, for delivery in the first half of 1918, and considering the long delivery, both inquiry and sales are considerable. An early advance for this delivery is predicted. The inquiry for silvery grades is over the first half of next year. Ohio silveries are available at \$45, furnace, or \$47.75, Chicago. One producer of Lake Superior charcoal iron, grades Nos. 1 to 5, taking freight rate of \$1.75, quotes 1917 delivery at \$41.75, Chicago. Scotch and No. 6, delivery this year, are quoted at \$43.25, Chicago. The same maker for 1918 delivery quotes \$38.75 and \$40.25, Chicago, respectively. Another producer gives a range of \$42 to \$47, Chicago, covering all grades for 1917 delivery and \$39 to \$45 for 1918. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 1 to 5.....	\$41.75 to \$42.00
Lake Superior charcoal, No. 6 and	
Scotch	43.25
Northern coke foundry, No. 1.....	39.50
Northern coke foundry, No. 2.....	39.00
Northern coke foundry, No. 3.....	38.50
Northern high-phosphorus foundry.....	38.00
Southern coke No. 1 f'dry and 1 soft.....	39.00
Southern coke No. 2 f'dry and 2 soft.....	38.00
Malleable Bessemer	39.00
Basic	39.00
Low phosphorus	75.00
Silvery, 8 per cent.....	47.75
Bessemer ferrosilicon, 10 per cent.....	62.50

Ferroalloys.—Future 80 per cent ferromanganese is quoted at \$350 by a local producing interest. The prompt

market is not thoroughly tested, but it is probable that \$350 to \$400 would be obtainable for near-by delivery. Inquiry is good. Makers are asking \$60 to \$62 at furnace, Jackson County, for 10 per cent Bessemer ferrosilicon, which takes a freight rate of \$2.54 to Chicago.

Rails and Track Supplies.—Inquiry for standard section rails for delivery in late 1918 and early 1919 amounts to no less than 165,000 tons. Many small lots are included. In track supplies the railroads are not so keenly interested, inasmuch as most of them have covered their needs for next year. Quotations are unchanged as follows: Standard railroad spikes, 3.70c. to 3.80c., base; small spikes, 4c., base; track bolts with square nuts, 4.60c. to 4.70c., all in carloads, Chicago; tie plates, \$60 to \$70, f.o.b. mill, net ton; standard section Bessemer rails, Chicago, \$38, base; open-hearth, \$40; light rails, 25 to 45 lb., \$55; 16 to 20 lb., \$56; 12 lb., \$57; 8 lb., \$58; angle bars, 2.75c., base.

Structural Material.—Some mill representatives report a fairly lively demand for structural shapes, although new propositions are not notable either as to size or number. Railroads maintain that they cannot afford to build either cars or bridges at present prices. As for bridges, not a little wood is being used instead of steel. The nominal quotation is unchanged at 3.789c., Chicago, delivery at mill convenience, with prices for prompt deliveries running up to 4.189c. A boiler house for the Studebaker Corporation, South Bend, Ind., requiring 435 tons, has been awarded to a company not yet reported. The Mead-Morrison Mfg. Company, for the Aluminum Company of America, has awarded to the Milwaukee Bridge Company an ore tower at Baltimore, Md., requiring 145 tons. The Stroebel Steel Construction Company has been awarded 1228 tons of railroad girder bridges for the Calumet Sag Channel, Blue Island, Ill., for the Sanitary District of Chicago. The Pullman Company has been awarded a contract for building 100 box cars for the Chilean Government. About 100 cars, embracing 50 gondolas, 25 flat cars, 25 box cars, for the Duluth & Iron Range Railroad is pending, as it has been for some time.

We quote for Chicago delivery of structural steel out of jobbers' stocks, 4.59c.

Plates.—A mill which has narrow plates—72 in. and under—to offer in limited quantity for the second and third quarters is quoting 6.50c. to 7c., Pittsburgh, or 6.689c. to 7.189c. Chicago. Another producer also quotes 6.50c., Pittsburgh. On wide plates it is out of the market, as are several other makers. Meanwhile, the general demand is active, with several inquiries of large size before the mills. The quotation of the leading interest is nominal at 4.689c., Chicago, having none to sell for the remainder of the year.

We quote for Chicago delivery of plates out of jobbers' stocks, 6c.

Sheets.—On galvanized and black sheets an important producer announces that it is out of the market entirely. It disposed of a carload of galvanized it had in stock on the basis of 8c., for No. 28. One mill quotes 6c. to 7c. for Nos. 10 to 16 blue annealed, but another maker gives 5.50c. to 6c. on No. 10 blue annealed, and 5.75c. to 6c. for No. 28 black sheets. Needless to say, the demand is active, and jobbers have again advanced their quotations, now asking 8.75c. for No. 28 galvanized.

We quote for Chicago delivery out of stock, regardless of quantity as follows: No. 10 blue annealed, 5.75c.; No. 28 black, 6.25c., and No. 28 galvanized, 8.75c.

Rivets and Bolts.—The expected advance in the quotations for bolts, nuts, etc., came last week. Although the new prices, which became effective April 11, are from 10 to 15 per cent higher than those previously quoted, the manufacturers are not anxious to book contracts for the last half because of the uncertainties which confront them. The jobbers have not changed their quotations, but an advance is impending. Mill quotations are as follows: Carriage bolts up to $\frac{3}{4}$ x 6 in., rolled thread, 40; cut thread, 35-2½; larger sizes, 25; machine bolts up to $\frac{3}{4}$ x 4 in., rolled thread, with hot-pressed square nuts, 40-10; cut thread, 40; large

size, 30; gimlet-point coach screws, 45; hot-pressed nuts, square, \$2.10 off per 100 lb.; hexagon, \$1.90 off. Structural rivets, $\frac{3}{4}$ to $1\frac{1}{4}$ in., 4.75c. to 4.939c., base, Chicago, in carload lots; boiler rivets, 10c. additional.

Store prices are as follows: Structural rivets, 5c.; boiler rivets, 5.10c.; machine bolts up to $\frac{3}{4}$ x 4 in., 40-10; larger sizes, 35-5; carriage bolts up to $\frac{3}{4}$ x 6 in., 40-2 $\frac{1}{2}$; larger sizes, 30-5; hot-pressed nuts, square, \$3, and hexagon \$3 off per 100 lb.; lag screws, 50.

Bars.—A feature of the market is the increasing demand for concrete reinforcing rods, for which leading makers are asking 3.589c., Chicago, an indication of the extent to which builders are turning from steel to concrete construction. The quotation of the leading interest for mild steel bars—3.539c., Chicago—is, of course, a nominal figure, and actual quotations range from 3.789c. to 3.939c., Chicago. Common iron bars are about 3.25c., Chicago, and high carbon bars 3.25c. to 3.50c., Chicago. Delivery can be had, at the higher prices, this quarter. Shafting, in carloads, is quoted at 10 to 5 per cent off.

We quote prices out of store for Chicago delivery as follows: Soft steel bars, 4.25c.; bar iron, 4c.; reinforcing bars, 4.25c., base, with 5c. extra for twisting in sizes $\frac{1}{2}$ in. and over and usual card extras for smaller sizes; shafting list plus 5 per cent to plus 10 per cent.

Wire Products.—Specifications are heavier, and there is even greater desire on the part of consumers to contract for the future. We quote to jobbers as follows, per 100 lb.: Plain fence wire, Nos. 6 to 9, base, \$3.339; wire nails, \$3.389; painted barb wire, \$3.539; galvanized barb wire, \$4.239; polished staples, \$3.539; galvanized staples, \$4.239, all Chicago, carload lots.

Cast-Iron Pipe.—Nothing in the way of lettings is to be reported, although Toledo will to-morrow award about 220 tons of pipe and fittings. Wadena, Minn., this week, will place 125 tons. Bids were to be opened at Winnipeg, Man., to-day on 5000 tons of water pipe, but it may be a few days before a decision is reached. We quote as follows, per net ton, Chicago: Water pipe, 4 in., \$58.50; 6-in. and larger, \$55.50, with \$1 extra for class A water pipe and gas pipe, an advance of \$5.

Old Material.—The market continues strong. Some authorities say the mills have enough scrap under contract, but that they cannot get deliveries, and it looks as if, under the circumstances, there is not enough old material to go round. The railroads are not able to move material freely, even that which they are offering for sale, for the reason that they lack cars and labor. The railroad lists are few and small. The St. Paul is offering about 300 tons, and the Michigan Central and the Lake Erie & Western small lots. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Old iron rails	\$32.00 to \$33.00
Relaying rails	39.00 to 40.00
Old carwheels	24.00 to 25.00
Old steel rails, rerolling	33.00 to 34.00
Old steel rails, less than 3 ft.	31.00 to 31.50
Heavy melting steel scrap	27.50 to 28.00
Frogs, switches and guards, cut apart	27.50 to 28.00
Shoveling steel	25.50 to 26.00
Steel axle turnings	16.50 to 17.00

Per Net Ton	
Iron angles and splice bars	\$33.50 to \$34.00
Iron arch bars and transoms	34.50 to 35.00
Steel angle bars	28.00 to 28.50
Iron car axles	41.00 to 42.00
Steel car axles	41.00 to 42.00
No. 1 railroad wrought	30.00 to 30.50
No. 2 railroad wrought	28.00 to 28.50
Cut forge	28.00 to 28.50
Pipes and flues	16.50 to 17.00
No. 1 busheling	19.50 to 20.00
No. 2 busheling	14.00 to 14.50
Steel knuckles and couplers	28.00 to 29.00
Steel springs	29.50 to 30.00
No. 1 boilers, cut to sheets and rings	17.50 to 18.00
Boiler punchings	24.00 to 24.50
Locomotive tires, smooth	38.00 to 38.50
Machine-shop turnings	10.50 to 11.00
Cast borings	11.00 to 11.50
No. 1 cast scrap	20.75 to 21.25
Stove plate and light cast scrap	14.00 to 14.50
Grate bars	15.00 to 15.50
Brake shoes	15.00 to 15.50
Railroad malleable	20.50 to 21.00
Agricultural malleable	18.50 to 19.00

The Huntington Steel Foundry, Huntington, Ind., will install a 4-ton electric furnace. Barton R. Shover, Diamond Bank Building, Pittsburgh, will act as engineer for the new installation.

Philadelphia

PHILADELPHIA, Pa., April 17, 1917.

A very interesting situation has arisen in regard to a number of Norwegian vessels which are now under charter to transport iron ore from Cuba to the United States. These charters were made for long periods, some of them being for five years and still having two or three years before expiration. The carrying rate provided in the charters is \$1.50 per ton, or less than one-sixth of the amount that could now be obtained. Since both the United States and Cuba have entered the great war, the owners of the vessels have announced that, as they will be exposed to new perils, the boats will be withdrawn from the service. On the other hand, the ore shippers are threatening to seize the vessels and fight out in the courts the questions that will then arise. Other phases of business in this district connected with the war relate mostly to the gradual adjustment connected with the policy of selling to the Government at rates much below those paid by other customers. In some cases in which contracts for machinery have been made with the Government, manufacturers are not asking price concessions on material which they are buying, but are being granted preference in deliveries. In the case of some material, however, notably structural shapes, concessions are being made to fabricators, and sellers are exercising great care to see that the material goes into Government work. On the whole, while it is recognized that many matters may have to be ironed out, the general feeling is that no serious difficulties will be experienced in carrying on business with the Government, and that the smaller companies will not be called upon to furnish tonnages so large as to cause embarrassment or heavy losses.

Pig Iron.—Another week of strong conditions with advancing prices has been added to the many that have preceded it. In some districts there is a shortage of labor, this being true particularly in iron ore mines from which laborers have gone to powder plants and other manufacturing concerns. Hence there is a danger of a shortage of local ore supply and possible curtailment of blast-furnace operations. The largest single sale of the week was a lot of 11,700 tons for delivery to the Bethlehem Steel Company throughout the last half of this year. The iron will be furnished by a New Jersey maker at about \$40 at furnace. The Virginia Iron, Coal & Coke Company, after selling a large tonnage of No. 2 iron for the first half of next year at \$34.50, furnace, advanced its price to \$35, furnace, Thursday night, and Monday withdrew entirely from the market. Its last sale for this year's delivery was at \$40, furnace. A sale of a small quantity of gray forge is reported at \$41, furnace, for last-half delivery, the sale being made by fracture with no guarantee as to analysis. This, however, is regarded as an exceptional transaction, and a quotation of from \$38 to \$39, furnace, probably more nearly represents the market. Prompt No. 2 X has advanced \$1 and is strong at \$42 to \$43, delivered. For this year's delivery or for first half of next year a limited tonnage is being sold at \$36, furnace. A sale of 2000 tons of low-phosphorus iron for last-half delivery has been made at \$75. About 10,000 tons of copper-bearing low-phosphorus iron has been sold in the past two weeks at about \$65, furnace. The usual quotation for standard low-phosphorus is now \$75 and \$70 and that for copper-bearing is \$70. Quotations for standard brands delivered in buyers' yards for prompt shipment range about as follows:

Eastern Pa. No. 2 X foundry	\$42.00 to \$43.00
Eastern Pa. No. 2 plain	41.50 to 42.50
Virginia No. 2 X foundry	40.75 to 42.75
Virginia No. 2 plain	40.25 to 42.25
Gray forge	39.75 to 41.75
Basic	38.00 to 40.00
Standard low-phosphorus	70.00 to 75.00

Ferroalloys.—The ferromanganese market is feverish. With the English manufacturers entirely out of the market, domestic sellers are quiescent. A limited amount of electrolytic ferromanganese can be had at from \$400 to \$425. It is believed in some quarters that evidence of a larger supply of the domestic product than is now apparent will soon develop. There are also

indications that England intends to take care of some steel manufacturers who are making munitions for the Entente Allies.

Structural Material.—Manufacturers of structural shapes report all kinds of offers, with nothing to sell. They are, however, taking care of Government orders and will continue to do so. Extraordinary demand from unexpected sources, especially from automobile concerns, has developed. The awarding of contracts for local subway construction has been indefinitely postponed owing to a deadlock in the State Public Service Commission in regard to authorizing the city of Philadelphia to construct the high speed lines. An effort will be made to relieve the situation by enactment of legislation at Harrisburg. The Lit Brothers' department store, which was planned to require 1500 tons of structural shapes, will be built of concrete.

Plates.—The demand for steel plates continues unabated. Mills are refusing to quote on many of the inquiries received. Various sales agents have been notified to accept no orders without first getting permission from headquarters. One large buyer who insisted that he must have 10,000 tons for specifications within a few months was granted only 2000 tons. This is an illustration of difficulties which even the largest buyers are having in placing orders. The maximum quotations of leading independents, which are shaded in some cases, are as follows: Tank steel, 7.159c.; ship steel, 8.659c. to 10.159c.; ordinary flange, 7.309c.; ordinary fire-box, 7.359c.; Lloyd's flange, 10.159c.; Lloyd's fire-box, 10.209c.; marine steel, 16.159c. to 17.159c.

Billets.—The scarcity of semi-finished material is even more serious. There are few transactions, but quotations apparently are at \$75 for open-hearth re-rolling billets and \$100 for forging billets.

Bars.—Leading manufacturers are complaining bitterly about the inability to obtain delivery on bars. The usual quotation on bar iron is still 3.50c., Pittsburgh, or 3.659c., Philadelphia. On steel bars the Carnegie Steel Company quotes 3.35c., Pittsburgh, for indefinite delivery, and independents are quoting 3.75c. for fairly prompt delivery.

Sheets.—The quotation on No. 10 blue annealed sheets has again been advanced \$5 per ton and is now 6c., Pittsburgh, or 6.159c., Philadelphia. The Government, directly or indirectly, is taking large tonnages of sheets.

Coke.—In spite of the general reports of improvement in the car situation, the supply is still inadequate, especially toward the close of every week, and often only about 40 per cent of the necessary number of cars can be obtained. Furnace coke is inactive, with \$8 to \$8.25 per net ton at oven as the usual quotation for prompt delivery, and \$7 to \$7.50 on contracts dating for six months from July 1. On foundry coke prices range from \$8.50 to \$9 on contract and \$9.50 to \$10.50 for prompt delivery.

Old Material.—Owing to the recent heavy buying in the Pittsburgh district many brokers are short and buying freely, but the mills are not. Quotations are about \$1 higher on old carwheels, No. 1 railroad wrought and No. 1 cast. Railroad malleable, which had been inactive, has advanced from \$3 to \$4. Quotations covering eastern Pennsylvania, and taking freight rates from 35c. to \$1.35 per gross ton, are as follows:

No. 1 heavy melting steel.....	\$25.00 to \$26.00
Old steel rails, rerolling.....	32.50 to 33.00
Low-phosphorus heavy melting steel	
scrap.....	37.00 to 38.00
Old iron and steel axles (for export)	47.00 to 48.00
Old iron rails.....	31.00 to 32.00
Old carwheels.....	26.00 to 27.00
No. 1 railroad wrought.....	36.00 to 37.00
Wrought-iron pipe.....	21.00 to 22.00
No. 1 forge fire.....	18.50 to 19.00
Bundled sheets.....	18.50 to 19.00
No. 2 busheling.....	15.00 to 16.00
Machine-shop turnings.....	15.00 to 16.00
Cast borings.....	15.50 to 16.50
No. 1 cast.....	27.00 to 28.00
Grate bars, railroad.....	18.00 to 19.00
Stove plate.....	18.00 to 19.00
Railroad malleable.....	23.00 to 24.00

The New York office of the National Founders' Association, now at 141 Broadway, W. C. Burgess in charge, will be removed on May 1 to room 511 at 90 West Street.

Cincinnati

CINCINNATI, OHIO, April 18, 1917.—(By Wire.)

Pig Iron.—Last week's sales books are decidedly different from the records of the previous week. Both Northern and Southern iron has been booked quite freely for shipment in the first half of 1918 and smaller lots were taken for shipment in the last half of this year. Among leading next-year sales noted are several of Southern iron to Northern Ohio consumers; the largest covers approximately 2500 tons. Another customer in the same district booked 1600 tons, and in central Ohio there were several orders taken of 500 tons each. Approximately 5000 tons of Southern iron was also bought by two nearby melters but strictly local business has been confined to small lots for filling in. A sale of 1000 tons Northern iron to a central Ohio firm for first-half delivery was made early last week and was followed by two or three other orders from the same territory ranging all the way from 500 to 1200 tons. Some silvery iron was also sold to Ohio and Indiana users for shipment in the first half of next year and it is understood that this iron brought \$46 at furnace. One producer is asking \$50 for an 8 per cent analysis. The price of Southern foundry for prompt shipment is problematical as the supply has practically been exhausted. A few carloads have brought as high as \$37 to \$38, Birmingham. The minimum price for last half is \$35 and quotations for the first half of next year range from \$33 to \$35, Birmingham basis. Northern iron is quoted at \$40, Iron-ton, for this year's shipment and \$38, for the first half of next year, but it is understood that business from old customers where it can be accepted for this year's movement would be taken at \$38. Virginia producers are out of the market but the last price quoted was \$35, at furnace, for next year shipment. A medium-sized malleable sale was made in central Ohio for first-half shipment next year. Based on freight rates of \$2.90 from Birmingham and \$1.26 from Iron-ton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 f'dry and 1 soft.....	\$38.40 to \$38.90
Southern coke, No. 2 f'dry and 2 soft.....	37.90 to 38.40
Southern coke, No. 3 foundry.....	37.40 to 37.90
Southern coke, No. 4 foundry.....	36.90 to 37.40
Southern gray forge.....	31.90 to 32.40
Ohio silvery, 8 per cent silicon.....	47.26 to 48.26
Southern Ohio coke, No. 1.....	39.76
Southern Ohio coke, No. 2.....	39.26
Southern Ohio coke, No. 3.....	38.76
Southern Ohio malleable Bessemer.....	39.26
Basic, Northern.....	39.26
Lake Superior charcoal.....	39.20
Standard Southern carwheel.....	36.40

(By Mail)

Coke.—Foundry coke business is light, although a few small lots are sold for both prompt and future delivery almost every day. Prices for prompt 72-hr. coke range from \$10.50 to \$11.50 in all three districts, but contract figures are \$7.50 to \$9 per net ton at oven. Cars are more plentiful, although there is yet considerable delay in getting shipments to certain points through on scheduled time. Furnace coke is listless with none being ordered for either prompt or forward shipment. Contract prices are around \$7 to \$7.50 per net ton at oven.

Finished Material.—Both black and galvanized sheets have been advanced by the nearby mills, and we quote No. 28 black to-day at 7.15c. f.o.b., Cincinnati, or Newport, Ky., and No. 28 galvanized at 9.15c. Some business has been booked even at these advanced figures, although orders received do not specify as large tonnages as in usual times. Warehouse prices are unchanged this week, and we quote from jobbers' stocks as follows: plates 6c.; structural shapes, 4.60c.; steel bars, 4.40c.; twisted steel bars, 4.55c.; No. 10 blue annealed sheets, 5.75c.; machine bolts, $\frac{3}{8}$ x 4 in. and smaller, 50 per cent discount; larger and longer, 30 and 10 per cent discount; set screws, 45 per cent discount; files, 50 and 10 per cent discount, and hack saws, 10 per cent discount. Wire nails remain at \$3.60 per keg base and barb wire at 4.40c. to 4.50c. per lb. Although warehouse stocks have increased slightly in the past 10 days, it is frequently necessary for the jobbers to curtail customers' purchases on many standard items carried in order to distribute shipments more evenly.

Mill agencies report a heavy demand for different kinds of screw machine products.

Old Material.—The market is showing more life, and advances have been made on every grade of scrap. Even cast borings and turnings that have been a drag on the market for some time are showing signs of improvement and have registered a general advance of 50c. a ton over last week's figures. The following are dealers' prices f.o.b. at yards Cincinnati and southern Ohio:

Per Gross Ton	
Bundled sheet scrap.....	\$17.00 to \$18.00
Old iron rails.....	26.50 to 27.00
Relaying rails, 50 lb. and up.....	30.50 to 31.00
Rerolling steel rails.....	30.00 to 30.50
Heavy melting steel rails.....	23.50 to 24.00
Steel rails for melting.....	22.50 to 23.00
Old carwheels.....	22.50 to 23.00
Per Net Ton	
No. 1 railroad wrought.....	\$25.50 to \$26.00
Cast borings.....	7.00 to 7.50
Steel turnings.....	7.00 to 7.50
Railroad cast.....	19.50 to 20.00
No. 1 machinery cast.....	20.00 to 21.00
Burnt scrap.....	11.50 to 12.00
Iron axles.....	33.50 to 34.00
Locomotive tires (smooth inside).....	34.00 to 35.00
Pipes and flues.....	14.50 to 15.00
Malleable cast.....	16.50 to 17.00
Railroad tank and sheet.....	15.00 to 15.50

Cleveland

CLEVELAND, OHIO, April 17, 1917.

Iron Ore.—The first shipment of ore from the mines to the docks was made to Escanaba yesterday, and it is expected that the first cargo from that port will be shipped on Friday. Ice conditions on Lake Superior are not improving rapidly, and it is still uncertain when boats can make a start from that region. The market is inactive. We quote prices as follows, delivered lower Lake ports: Old range Bessemer, \$5.95; Mesaba Bessemer, \$5.70; old range non-Bessemer, \$5.20; Mesaba non-Bessemer, \$5.05.

Pig Iron.—The United Alloy Steel Corporation, Canton, Ohio, has purchased about 18,000 tons of basic iron for third-quarter delivery in addition to 5000 tons bought two weeks ago. The last purchase was made at about \$40.50, delivered. Of this 10,000 tons will be supplied by a Chicago furnace and the remainder by Valley and southern Ohio furnaces. It is understood that the Valley iron was secured at \$39.50 at furnace. However, it is doubtful if any additional basic can be had under \$40. The Canton consumer is understood to be still in the market for basic for the third quarter. Advances on Northern foundry iron have apparently halted for the time being, as, aside from an advance of \$1 per ton by a Valley interest, prices are the same as a week ago. However, the market is very firm. The demand for foundry iron for the first half of next year continues active and there is a fair demand for such iron for the last half of this year, with a scarcity in the supply. The market in the Cleveland territory, which has been rather quiet during the heavy buying in the surrounding districts of the past few weeks, is now showing more life. Foundry iron has sold at \$42 for No. 2 in Cleveland, for prompt shipment and last half, but \$40 is the more general quotation for the remainder of the year. Valley iron for the first half of next year has sold at \$40, and this price is being quoted by Cleveland furnaces, but without sales as one Lake furnace is offering No. 2 foundry iron at \$38 for next year's delivery. Southern iron is quoted at a minimum price of \$33, Birmingham, for No. 2 for the first half of next year, at which a number of sales have been made in this territory. Quotations range from \$35 to \$40 for this year and \$33 to \$35 for next year. A Cleveland foundry is inquiring for 3000 to 4000 tons of low-phosphorus Southern iron for the last half. A sale of silvery iron has been made at \$46 at furnace for 8 per cent silicon for the first half of next year, but on a Cleveland inquiry for 1000 tons another interest quoted \$50 for that delivery. We quote, delivered Cleveland, as follows:

Bessemer.....	\$42.95
Basic.....	40.30
Northern No. 2 foundry.....	\$39.25 to 41.30
Southern No. 2 foundry.....	37.00 to 39.00
Gray forge.....	37.95 to 38.95
Ohio silvery, 8 per cent silicon.....	47.62
Standard low phos., Valley furnace.....	75.00

Coke.—Shipments on contracts are good, and spot prices are easier. New demand is light. We quote standard Connellsville foundry coke at \$9 per net ton at oven for prompt shipment and \$8 to \$8.50 for contracts. Furnace coke is quoted at \$7.50 to \$8.50 for prompt shipment.

Bolts, Nuts and Rivets.—The expected advance in prices for bolts and nuts has been made, going into effect April 16. It is the sharpest of any recent price advances, being 10 to 15 per cent. The new price applies both to current orders and last-half contracts. However, the new prices are being shaded from 2½ to 5 per cent to large consumers, who are now covering for their last-half requirements. The advance is due to the higher cost of steel and wire and uncertainty as to the cost of fuel oil in the last half. An advance has also been made on rivets, which are \$3 per ton higher. New rivet prices are 4.90c., Pittsburgh, for structural and 5c. for boiler rivets, for prompt shipment and third-quarter delivery. The new discount on small rivets is 40 per cent. Bolt and nut discounts are as follows:

Common carriage bolts, ¾ x 6 in., smaller or shorter, rolled thread, 40 off; cut thread, 35 and 2½; larger or longer, 25. Machine bolts, with h. p. nuts, ¾ x 4 in., smaller or shorter, rolled thread, 40 and 10; cut thread, 40; larger and longer, 30. Lag bolts, cone point, 45. Square h. p. nuts, blank, \$2.10 off list; tapped, \$1.90 off list. Hexagon h. p. nuts, blank, \$1.90 off; tapped, \$1.70 off. C. p. c. and t. hexagon nuts, all sizes, blank, \$1.60 off; tapped, \$1.40 off. Cold pressed semi-finished hexagon nuts, 50 and 10 off.

Old Material.—The market is quiet, but prices are firm in spite of the inactivity and advances have been made on several grades. Local mills are well supplied and will not pay the prices asked at present. The advance in steel-making scrap has caused some material to be thrown on the market by dealers who are taking a good profit, but dealers generally are looking for still higher prices, and are unwilling to sell short. Foundry scrap is higher and in good demand. It is reported that as high as \$23.50 has been offered for No. 1 cast scrap. Stove plate has sold at \$16, and railroad grate bars at \$17. We quote f.o.b. Cleveland as follows:

Per Gross Ton	
Steel rails.....	\$25.50 to \$26.50
Steel rails, rerolling.....	34.00 to 35.00
Steel rails under 3 ft.....	31.00 to 32.00
Iron rails.....	33.00 to 34.00
Steel car axles.....	45.00 to 47.00
Heavy melting steel.....	27.50 to 28.00
Carwheels.....	23.50 to 24.00
Relaying rails, 50 lb. and over.....	37.00 to 38.00
Agricultural malleable.....	18.25 to 18.50
Railroad malleable.....	24.00 to 25.00
Light bundled sheet scrap.....	17.00 to 17.75
Per Net Ton	
Iron car axles.....	\$46.00 to \$47.00
Cast borings.....	11.75 to 12.00
Iron and steel turnings and drillings.....	10.75 to 11.00
No. 1 busheling.....	20.50 to 21.00
No. 1 railroad wrought.....	32.00 to 32.50
No. 1 cast.....	22.50 to 23.50
Railroad grate bars.....	17.00 to 18.00
Stove plate.....	15.50 to 16.50

Finished Iron and Steel.—New demand for plates continues heavy, and a local mill has advanced its price to 7c., Pittsburgh. This advance does not appear to affect the volume of business. Sheet bars are in good demand for early shipment. Local sales have been made at \$75, \$80 and higher, and it is claimed that mills could now take orders at \$90 and higher for early shipment were they able to furnish the steel. A local mill is quoting forging billets at \$110. The Lakewood Engineering Company has taken an additional contract for portable railroad track for France, requiring 4000 tons of light rails, for which it has placed an order. Frog and switch companies are in the market for additional rail tonnage for 1918. The structural trade is quiet. Bar iron is in good demand and is higher, being now quoted at 3.25c., Cleveland. Hard steel bars are unchanged at 3.25c. at mill. One maker has advanced spike prices 20c., to \$3.85. The demand for sheets continues heavy and prices are higher. The new sheet mill of the Empire Rolling Mill Company, Cleveland, Ohio, consisting of six hot and four cold mills, will be placed in operation about May 1. This mill was completed over a year ago, but has never been operated. As high as 9c. is being asked for

galvanized sheets. We quote sheets at 6c. to 6.50c. for No. 28 black; 5.75c. to 6.25c. for No. 10 blue annealed and 7.75c. to 8.25c. for No. 28 galvanized. Warehouse prices have been advanced \$3 per ton on steel bars and structural material, \$8 on plates and \$15 on blue annealed sheets. We quote warehouse prices at 4.50c. for steel bars, 4.75c. for shapes, 6c. for plates and 6.25c. for blue annealed sheets.

St. Louis

ST. LOUIS, Mo., April 16, 1917.

Pig Iron.—Consumers entered the market this week and made it evident they were willing to pay the price for 1918 delivery. A larger amount was sold than for a long time. The total transactions probably ran to 12,000, or possibly 15,000 tons, while the inquiries still outstanding and under submission to the furnaces include 1000 and 1500 tons of No. 2 Northern, 1000 tons of high silicon, 500 tons of Southern No. 1, 1000 tons of Jackson County high silicon, and 1000 tons of Bessemer ferrosilicon. Only one contract, for No. 1 Southern, 500 tons, was put on for last quarter delivery. The selling was on a wide spread of prices and altogether the situation was decidedly excited.

Coke.—A considerable number of small contracts for last half and for the first half of 1918 were made at \$8.50, at the Connellsville ovens, for best selected 72-hr. foundry coke. The local by-product plant has put its prompt price at \$10 at oven.

Finished Iron and Steel.—Light rails were in active request in the week, on a basis of \$55, Pittsburgh, and about 1500 tons were sold all to coal interests. In standard section steel rails an inquiry for 2000 tons for 1918 delivery to a Southwestern road will be closed this week. An inquiry for 5000 kegs of spikes is at the closing point at this writing. Movement out of warehouse continues very heavy, the prices being paid without dissent by consumers who are in need of the material. Warehouses are finding it difficult to keep their supplies up to a satisfactory delivery point. We quote for stock out of warehouse as follows: Soft steel bars, 4.30c.; iron bars, 4.25c.; structural material, 4.55c.; tank plates, 6.05c.; No. 10 blue annealed sheets, 5.80c.; No. 28 black sheets, cold rolled, on pass, 6.35c.; No. 28 galvanized sheets, black sheet gage, 8.85c.

Old Material.—Scrap is in sharp demand and stiffly higher. Railroads are beginning to let go to take advantage at the prices prevailing such material as they can pick up. These lots have no effect on the market. Transactions are altogether on the basis of immediate needs, for neither consumer nor dealer is willing to predict the future. We quote dealers' prices, f.o.b. customers' works, St. Louis industrial district, as follows:

Per Gross Ton	
Old iron rails	\$30.50 to \$31.00
Old steel rails, rerolling	32.50 to 33.00
Old steel rails, less than 3 ft.	30.00 to 30.50
Relaying rails, standard section, subject to inspection	35.00 to 38.00
Old carwheels	23.50 to 24.50
No. 1 railroad heavy melting steel scrap	27.00 to 27.50
Heavy shoveling steel	25.50 to 26.00
Ordinary shoveling steel	21.50 to 22.00
Frogs, switches and guards cut apart	27.00 to 27.50
Ordinary bundled sheet scrap	16.00 to 16.50
Heavy axle and tire turnings	15.00 to 15.50

Per Net Ton	
Iron angle bars	\$29.00 to \$29.50
Steel angle bars	25.50 to 26.00
Iron car axles	41.00 to 41.50
Steel car axles	39.00 to 40.00
Wrought arch bars and transoms	31.00 to 31.50
No. 1 railroad wrought	30.00 to 30.50
No. 2 railroad wrought	27.00 to 27.50
Railroad springs	27.00 to 27.50
Steel couplers and knuckles	28.00 to 28.50
Locomotive tires, 42 in. and over, smooth inside	38.00 to 39.00
No. 1 dealers' forge	24.00 to 24.50
Cast iron borings	12.00 to 12.50
No. 1 busheling	19.50 to 20.00
No. 1 boilers, cut to sheets and rings	17.00 to 17.50
No. 1 railroad cast scrap	20.00 to 20.50
Stove plate and light cast scrap	14.00 to 14.50
Railroad malleable	20.00 to 20.50
Agricultural malleable	17.50 to 18.00
Pipes and flues	17.50 to 18.00
Heavy railroad sheet and tank scrap	16.00 to 16.50
Railroad grate bars	14.00 to 14.50
Machine shop turnings	12.00 to 12.50

Buffalo

BUFFALO, N. Y., April 17, 1917.

Pig Iron.—For delivery over the remainder of 1917 prices ranging from \$42 to \$45 are now the best obtainable, covering the lower to the higher grades. Little iron is being offered at these figures, because the furnace capacity is almost completely taken to the end of the year. Furnaces are quoting \$40 as the minimum for any grade for the first half of 1918, while one producing interest states that \$45 is its minimum for both 1917 and 1918. Another producer is not quoting at present for 1918 and is out of the market for 1917. There is a good deal of floating inquiry, both for small and good-sized lots, but sales have not been large, chiefly owing to the fact that furnaces have not the iron called for. One railroad equipment manufacturer has been in the market this week for 10,000 tons of basic iron. Quite a number of pig-iron users are asking their sources of supply to anticipate shipments on their orders for last-half deliveries. For delivery over the remainder of the year we quote as follows, f.o.b. furnace, Buffalo:

High silicon irons	\$45.00
No. 1 foundry	44.00 to 45.00
No. 2 X foundry	43.00 to 45.00
No. 2 plain	42.50 to 45.00
No. 3 foundry	42.00
Gray forge	42.00
Malleable	45.00
Basic	45.00
Charcoal (nominal)	42.00

Finished Iron and Steel.—Inquiry has been light, but prices are firmly held. Producers having material to sell have, it is stated, offered limited quantities, of designated sizes, to be shipped at the mills' convenience, at 3.50c., base, Pittsburgh, for steel bars and 3.75c. for structural shapes, and some tonnage has been booked on this basis. Tank plates are held at 5.50c. to 6c., Pittsburgh. Demand continues active from Canadian shipbuilding companies, and large orders for plates have been unable to find acceptance although 7.50c., base, has been offered to sellers for Lloyds' specification material. Some buyers of bars have taken iron bars at about the same price as steel, in order to secure more prompt delivery. Demand for tin plate continues strong; sellers have no difficulty in obtaining from \$8.25 to \$8.75 per base box, Pittsburgh. The George Kellogg Structural Steel Company has the contract for the steel for a foundry addition for the Continental Heater Corporation, Erie, Pa., approximately 100 tons, and the Ferguson Steel & Iron Company the contract for an equal lot for a shop addition to be built by the Goulds Mfg. Company, Seneca Falls, N. Y.

Old Material.—There is a let-up in the buying of heavy melting steel, consumers having apparently covered their requirements for the present. Dealers are proceeding carefully as regards further commitments in this commodity, considering it a debatable question as to whether the high point in price has not been reached. Turnings, borings, low-phosphorus, cast scrap and railroad malleable are all in strong demand and the buying of considerable quantities in each of these lines is reported. Although the suspension of buying in heavy melting steel may have a tendency to weaken the market somewhat, it has not been sufficient to affect the asking price and the entire list shows no change from last week. We quote dealers' asking price per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	\$27.50 to \$28.00
Low phosphorus	35.00 to 36.00
No. 1 railroad wrought	33.00 to 34.00
No. 1 railroad and machinery cast	24.00 to 24.50
Iron axles	45.00
Steel axles	45.00
Carwheels	25.50 to 26.00
Railroad malleable	25.00 to 25.50
Machine shop turnings	13.00 to 13.50
Heavy axle turnings	18.50 to 19.00
Clean cast borings	13.00 to 13.50
Iron rails	27.00 to 27.50
Locomotive grate bars	16.50 to 17.00
Stove plate	16.50 to 17.00
Wrought pipe	17.00 to 17.50
No. 1 busheling scrap	22.00 to 22.50
No. 2 busheling scrap	14.00 to 14.50
Bundled sheet scrap	16.00 to 16.50

Birmingham

BIRMINGHAM, ALA., April 16, 1917.

Pig Iron.—As late as Friday of last week the leading interest was quoting \$32 for all deliveries, with some sales into 1918, but it was alone in that quotation. The other makers were all asking \$35. One company, which opened for 1918 at \$32, sold all it cared to dispose of for that delivery at this time and withdrew, with the intention of re-entering when consumers bid \$35. The leading foundry-iron interest is not seeking business, but is accommodating regular customers at \$35. As high as \$36 has been charged regular customers for carload lots by furnacemen claiming to have been inconvenienced by the forcing of such iron out of production for quick shipment. One seller booked a contract for the last half at \$35 the first part of the week past and retired from the market. Well-informed furnace operators express the belief that the unsold last-half capacity is not over 20 per cent and may be less than that. In spite of a record production in March, the net accumulation on yards was only around 15,000 tons, a remarkable achievement under the circumstances. Long idle stacks are to be put in operation. The list includes the Eagle charcoal furnace near Attalla, which the Gulf States Steel Company has leased and is about to operate on basic; the Silver Run charcoal stack at Rome, Ga., which the Matthews Iron & Mfg. Company has leased and is almost ready to operate on basic and special iron; the Little Bell at Bessemer, which the Tennessee Company is preparing for a run on special iron to be conveyed from the furnace to the steel mills at Ensley in molten state; the furnace at Trussville, which has been purchased from the Michigan Trust Company by E. A. Shedd and associates of Chicago, and which they say they will at once start repairing; the stack at Talladega, Ala., which is to be operated by the Bird Coal & Iron Company, Chicago, and upon which repairs have already been started; finally, the twin charcoal stack of the Shelby Iron Company at Shelby, Ala., which that company announces will in all likelihood go on regular foundry iron a little later. The only remaining available idle stack is the Battelle, near Chattanooga, which will go in blast if raw material can be secured. That will also prove a problem with most of the newcomers. With the exception of Battelle, all the stacks named are small ones. In a general way it might be said that the average consumer, who must buy iron, will have to pay \$35 for it if he purchases in the Birmingham district. We quote, per gross ton, f. o. b. Birmingham district furnaces, as follows:

No. 1 foundry and soft.....	\$34.50 to \$35.50
No. 2 foundry and soft.....	34.00 to 35.00
No. 3 foundry.....	33.50 to 34.50
No. 4 foundry.....	33.25 to 34.25
Gray forge.....	33.00 to 34.00
Charcoal.....	37.50 to 38.50
Basic.....	34.00 to 35.00

Cast-Iron Pipe.—For the first time in several weeks cast pipe makers failed to advance quotations. Consumers respond to the higher prices more easily than was expected, and plants receive orders sufficient to maintain large operations. We quote, per net ton, f. o. b. pipe shop yards, as follows: 4-in., \$48; 6-in. and upward, \$45; with \$1 added for gas pipe and special lengths.

Coal and Coke.—Coal operators enjoy prices, output and demand unprecedented. The Alabama 1916 output, it is now ascertained, went to 18,200,000 tons, an increase of 3,000,000 tons over 1915. The coke output was 4,385,000 tons as compared with 2,958,000 tons in 1915. Both outputs are on a still higher basis at this time. Railroads are paying \$1.70 per net ton and over for run-of-mine coal. In the mill trade steam coal is bringing from \$2.75 to \$3.75, while blacksmith coal commands \$5 and \$6. Standard beehive foundry coke sells under contract at \$12.50 and what little spot can be squeezed out is readily taken at \$15 per net ton f. o. b. oven. Furnace coke, which is so scarce as to be almost a myth, brings \$5 and \$6. The Sloss-Sheffield may relight its City ovens under special permit from the local authorities.

Old Material.—The scrap market is quite brisk, but

there is a wide diversity in prices obtained, some consumers paying as much as \$1 per ton over others. Machinery cast is in special demand, but all grades are moving in good volume. We quote, per gross ton, f. o. b. dealers' yards, as follows:

Old steel axles.....	\$35.00 to \$40.00
Old steel rails.....	20.00 to 21.00
No. 1 wrought.....	22.00 to 23.00
No. 1 heavy melting steel.....	18.50 to 19.50
No. 1 machinery cast.....	19.00 to 20.00
Carwheels.....	17.00 to 18.00
Tramcar wheels.....	15.50 to 16.00
Stove plate and light.....	14.00 to 14.50
Turnings.....	8.75 to 9.25

Bars.—Steel bars, in carloads, f. o. b. Birmingham, are quoted at 3.50c. to 3.75c.; iron bars, 3.35c. to 3.50c.

San Francisco

SAN FRANCISCO, CAL., April 10, 1917.

In the past few weeks practically all steel commodities except wire products have seen advances in price, and there is no promise that materials will become cheaper here. The fact of war having been declared has not as yet been the cause of radical advances, but there is no telling what effect hostilities will have in the near future. Business has improved as spring has advanced, especially in industrial and commercial building. A somewhat backward tendency is noticed in connection with public work. Many public improvements have been held up, largely by reason of the bond issues voted some time ago proving inadequate in the face of soaring costs of materials. Now that war is on, it may be expected that the State and municipalities will be more inclined than ever to conserve their financial resources to be in readiness to favor preparedness measures.

Bars.—As long as pig iron keeps advancing there is no hope of a settled condition on bars and other steel products. The jobbers and manufacturers have been compelled to make revised quotations with unusual frequency of late and the present price lists are perhaps no more firmly established than the others. Wholesale prices are as follows: Rounds and squares, for sizes 3-in. and under, 5c.; over 3-in., 6c.; twisted steel bars, 5c.; flats, 1/4 in. and heavier, 5c.; bands, 3/16 and 1/2 in., 6c.; rounds and squares, 5/16, 3/4 and 3/16 in., 6c. Iron bars are quoted at 4.90c.

Structural Material.—The volume of business for the coming building season will probably be normal, owing to the many special needs for bridges, industrial structures, railroad improvements and Government work. The Pacific Coast Steel Company has begun to prepare for a much larger output than heretofore by purchasing a 10-acre site at Linnton, Ore., for the erection of a new steel plant.

Plates.—The situation has grown steadily worse and the shipbuilding industry is seriously handicapped. Wherever practicable wooden ships are being constructed to take the place of steel, especially all classes of motor ships. Deliveries of plates from the East are still slow, even on old contracts. Jobbers are quoting 7.50c. on 1/4-in. tank plates, a rise of 5c. per 100 lb. in the past two weeks. The Craig Shipbuilding Company has secured a municipal permit for the construction of the first unit of its plant at Long Beach, Cal. This unit will be the machine shop.

Sheets.—There is a steady demand but no big contracts offering. Manufacturers are quoting third-quarter delivery at Pacific coast terminals at 7c. on blue annealed. Jobbers in San Francisco quote on blue annealed, No. 10, 7.25c.; No. 12, 7.30c.; No. 14, 7.35c., and No. 16, 7.45c. Flat galvanized sheets have advanced to 8.72c. on Nos. 12 and 14. The price on No. 28 is now 9.60c. Occasionally premiums are offered on galvanized. The Pacific Metal & Galvanizing Company, with capital of \$20,000 has been incorporated at Seattle to engage in galvanizing metal by the hot dip process. The first unit to be erected will have a capacity of 5000 tons a year.

Wrought Pipe.—An advance of \$10 per ton on all classes of standard pipe and oil-country goods went into effect last week. The general demand is good and

the oil-country demand is greater than the supply. Two-inch lap welded boiler tubes are now listed at 26.35c. per 100 ft. Deliveries from the mills have not improved.

Cast-Iron Pipe.—A new advance of \$3 per ton is effective on the coast. On 4-in. \$61 is quoted, and \$58 for 6-in. and larger, class B and heavier, with \$1 extra for class A and gas pipe. There is a somewhat better tone to business this week. The city of Hanford has placed a contract with the United States Cast Iron Pipe & Foundry Company for 400 tons of 4 and 6-in. pipe to be used for fire protection.

Pig Iron.—Considerable anxiety is expressed in regard to future supplies, as foundries are running short. The coast price on No. 1 Foundry is \$45.32 on time delivery.

Coke.—Very little is coming in, but local supplies are still sufficient for present needs. Spot deliveries cannot be had for less than \$25 per ton, though easier prices are expected on future deliveries than were quoted last week.

Wire Products.—There is a good normal demand on most lines except woven wire fencing. Deliveries are only fair. The biggest demand for the time being is on wire rope for the logging, shipbuilding and oil industries.

Old Material.—Dealers are inclined to hold mixed wrought and steel scrap in expectation of better prices. The average price on this class is \$20 per ton, but \$25 may soon be nearer the selling figure. Heavy cast-iron scrap is freely quoted at \$22.50, yet local foundries have often paid as high as \$24. Light steel scrap sells around \$16. Horseshoes sell readily at \$25 to \$30, the export demand being lively.

New York

NEW YORK, April 18, 1917.

Pig Iron.—The appearance of a considerable quantity of resale iron offered by a number of companies suggests the possibility of the upward trend of prices being checked. While there has been a limited amount of resale iron on the market almost constantly since the price struck \$30, a larger tonnage has been offered during the past week, which has not been one of marked activity in this district. The principal purchase was 11,700 tons of Bessemer for delivery in the six months beginning July 1, purchased by the Bethlehem Steel Company at about \$40, furnace. The iron will be supplied by the Wharton stacks. The largest transaction in foundry iron was a sale of 5000 tons to the Central Foundry Company for delivery this year at from \$41 to \$42 furnace. The iron will be supplied by Virginia and Pennsylvania stacks. A sale of 6000 tons of special analysis iron for last quarter was made to a New England buyer. Details of this transaction were carefully guarded. A sale of 2000 tons of No. 2 X for the first half of next year was made for delivery at Waverly, N. J., the customer taking 1000 tons of eastern Pennsylvania, 250 tons of western Pennsylvania and 750 tons of Virginia irons. There is very little activity in Virginia irons. The leading seller has withdrawn from the market temporarily after having advanced to \$35 furnace, for next year's delivery and \$40 furnace for this year. For No. 2 X Pennsylvania irons the usual quotation is \$41 to \$42 tidewater for this year's delivery and from \$38 to \$40 for first half of next year, but sales have been made at lower figures. Leading sellers of Buffalo iron are quoting \$40 for next year's delivery, \$45 for this, but are not finding consumers anxious to place orders at these figures, and very little iron is being sold. The American Locomotive Company will close to-day on 3300 tons of various foundry grades for delivery at its Montreal plant through the next six months. We quote at tidewater for early delivery as follows:

No. 1 foundry.....	\$42.00 to \$43.00
No. 2 X.....	41.00 to 42.00
No. 2 plain.....	40.00 to 41.00
Southern No. 1 foundry.....	39.00 to 40.00
Southern No. 2 foundry and soft.....	38.00 to 39.00

Ferroalloys.—Sales of carload lots of ferromanganese have been made at \$400, delivered, and in several

transactions of smaller lots as high as \$500 per ton, delivered, has been paid. While practically no British alloy is offered for sale for delivery this year one dealer is quoting \$350, delivered, for the domestic product for any delivery in 1917. The market is difficult to quote, as most of the sales made depend upon the needs of the consumer. It is understood that one representative of British makers, whose licenses for March shipment have been held up, is now informed that only those licenses will be recognized which cover shipments to steel makers in this country furnishing steel for the British Government. Should this policy be generally adopted it would curtail considerably the supplies from that source. Imports in March, according to incomplete reports to THE IRON AGE, were probably over 5000 tons. Spiegeleisen, 20 per cent, is strong and active, sales of about 3000 tons having been made in the last week around \$75, furnace, for delivery this year. Ferrosilicon, 50 per cent, continues in strong demand and \$250, delivered, is asked for small lots for shipment this year.

Structural Material.—The market is generally quiet and not much activity is looked for until the course of affairs resulting from our entrance into the war has assumed a more settled trend. After that it is expected that the volume of business will be as large as at any time in the recent past. The Pennsylvania Railroad is inquiring for 800 tons for 10 small bridges and the Boston & Maine for 200 tons for some small bridges and one small building. The Central of Georgia will buy 200 tons for a freight station at Macon, Ga. Contracts recently let include the following: The McClintic-Marshall Company and Lewis F. Shoemaker & Co. will furnish jointly 1200 tons to the New York Central for three grade crossings; the McClintic-Marshall Company will build two crane runways, 650 tons, for the Norfolk Navy Yard, Norfolk, Va., while the second crane runway at the League Island Navy Yard, Philadelphia, involving 3500 tons, has been awarded to the American Bridge Company. This company has also secured the contract for the new gun shop at Washington, which calls for not less than 4150 tons. The New England Structural Company will furnish 600 tons for a power house for the Boston Edison Company and 300 tons for the New Bedford Electric Power Company, New Bedford, Mass. Lewis F. Shoemaker & Co. have taken 350 tons for a new building for the Carpenter Steel Company, Reading, Pa., and 100 tons for a bridge for the Philadelphia & Reading. The Ferguson Iron & Steel Company has been awarded 400 tons for an extension to the power house of the Utica Gas & Electric Company, Utica, N. Y., and the Bethlehem Steel Bridge Corporation has secured the new building for the Passaic Cotton Mills at New Bedford, Mass., calling for about 900 tons. We quote plain material from mill at 4.169c. to 4.919c., New York, the lower price in three to four months and the higher for small lots in earlier deliveries. Shipments from warehouse are \$5 per ton higher, or 4.75c. per lb., New York.

Bars, Plates, Etc.—The week has not been one of large sales but there is no diminution of inquiry and with some selling agencies the number of quotations now out probably represent a maximum. Government buying of shell steel will probably be the result of quiet negotiations between the Government and the steel producers for specific lots, at least the signs at the moment thus point, and shell makers will thus bid on manufacturing without including the cost of steel or copper. It is felt that this method will be a stabilizing one so far as general market prices are concerned. What would happen in respect to a preferential price were the Allies to purchase shell forgings for delivery beyond June is as yet a matter of the future. So far, nothing is heard of the cancellation of shell steel contracts and the substitution of other forms of steel. In some quarters, indeed, it is thought that the buyer might be willing to cancel such substitution material if the producer should be of a like mind. As regards Government buying of ship steel, it is suggested that perhaps the leading interest will take all or substantially all under consideration at this time. Wire is exceedingly strong; 1000 tons for delivery in about four months for domestic use has sold at 3.50c., Pittsburgh,

or \$7 per ton above the minimum price. Fresh inquiries for plates, chiefly for Oriental ship builders, continue to be the conspicuous feature in the plate market, but sales have been infrequent. A sale of about 1000 tons of tank plates in a few months is noted at 6c., Pittsburgh, and 150 tons in three months at 6.50c. Bar iron has lately been selling at 3.50c., Pittsburgh, to as high as 4.75c., and 3.75c. is not infrequent. Noteworthy advances have been made in warehouse prices, \$10 per ton in plates, \$6 in bar iron and \$3 in steel bars. We quote mill shipments of universal and tank plates at 6.169c. to 6.669c., New York, in a few months and ship plates at about 8.169c., New York. We quote steel bars at 3.919c., New York, and iron bars at 3.669c. to 3.919c., New York. From New York district warehouses we quote iron bars at 4.30c.; steel bars at 4.50c., and steel plates at 7c.

Cast-Iron Pipe.—Auburn, N. Y., will open bids April 27 on about 400 tons of 4 to 42 in. This is the most important municipal letting now in sight in this locality. Numerous small lettings are steadily coming out, and private buying is of good volume. Prices are firmly held, with carload lots of 6-in., class B and heavier, quoted at \$50.50 per net ton, class A and gas pipe taking the usual extra of \$1 per ton.

Old Material.—The strength of the market is maintained, but in heavy melting steel scrap dealers are now paying higher prices than the steel companies. Western consumers of steel scrap have lowered their offers about \$3 per ton and steel companies in eastern Pennsylvania are also reducing theirs somewhat. Wrought scrap continues scarce, and sales of No. 1 railroad have been made as high as \$42, delivered eastern Pennsylvania. Rerolling rails are higher; a sale of a round lot was made to a western Pennsylvania consumer at \$38.50, delivered. Cast borings are stronger, but turnings are unchanged. Brokers quote buying prices as follows to local dealers and producers, per gross ton, New York:

Heavy melting steel scrap (for shipment West)	\$24.00 to \$25.00
Heavy melting steel scrap (for shipment to eastern Pennsylvania)	22.00 to 22.50
Relaying rails (nominal)	41.00 to 42.00
Rerolling rails	35.00 to 35.50
Iron and steel car axles	46.00 to 47.00
No. 1 railroad wrought	38.00 to 39.00
Wrought-iron track scrap	31.00 to 32.00
No. 1 yard wrought, long	30.00 to 31.00
Light iron	7.50 to 8.00
Cast borings (clean)	13.50 to 14.50
Machine-shop turnings	11.50 to 12.00
Mixed borings and turnings	11.50 to 12.00
Wrought-iron pipe (not galvanized or enameled)	19.50 to 20.00

Cast scrap is in good demand, with sales of considerable quantities at \$28.50 to \$30, delivered, equal to \$27 to \$28, New York. Dealers in New York City and Brooklyn, however, continue to quote prices to local foundries as follows, per gross ton, New York:

No. 1 machinery cast	\$23.00 to \$24.00
No. 1 heavy cast (columns, building material, etc.)	22.00 to 23.00
No. 2 cast (radiators, cast boilers, etc.)	19.00 to 20.00
Stove plate	16.00 to 17.00
Locomotive grate bars	16.00 to 17.00
Old carwheels	27.00 to 28.00
Malleable cast (railroad)	22.50 to 23.00

British Steel Market

Pig Iron and Tin Plates Firm and Strong—Ferromanganese Higher

LONDON, ENGLAND, April 18, 1917.—(By Cable.)

The pig-iron market is firm and the advance in Cleveland iron, cabled last week, has been officially confirmed. Tin plates are strong at 28s, owing to further curtailment in deliveries of steel. Black sheets are quoted at £20 and ferromanganese at £38 to £39. Semi-finished steel is nominal. We quote as follows:

Tin plates, coke, 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 28s. against 27s. 6d. last week.	
Ferromanganese, £38 to £39 against £37 nominal one week ago.	
Ferrosilicon, 50 per cent. c.i.f., £35 upward.	

Iron and Industrial Stocks

NEW YORK, April 18, 1917.

For a portion of the past week a more cheerful feeling predominated and prices of stocks gradually hardened. The upward course of values, however, received a check when announcement was made that the British Government had taken over many of the International Mercantile Marine vessels, and about the same time the proclamation of the President appeared, in which Federal control of prices and profits in this country was foreshadowed. The recessions which then occurred were quite marked in some stocks. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com.	24 1/2 - 26 1/4	Int. Har. of N. J., pref.	114 1/2 - 116
Allis-Chal., pref.	81 - 81 1/2	Int. Har. Corp., com.	76 1/4 - 81 1/8
Am. Can., com.	44 1/2 - 47	Int. Har. Corp., pref.	111 1/2
Am. Can., pref.	106 - 106 1/4	Lacka. Steel, com.	81 1/2 - 86
Am. Car & Fdy., com.	64 1/2 - 67 1/2	Lake Sup. Corp., 19 1/2 - 20 3/4	
Am. Car & Fdy., pref.	115 1/2 - 116 1/4	Lima Loco., com.	55 - 57 1/2
Am. Loco., com.	65 1/2 - 70	Lukens, com.	40 - 41
Am. Loco., pref.	103 1/2	Lukens, 1st pref.	101 1/2 - 103
Am. Rad., com.	285 - 290	Midvale Steel, com.	56 3/4 - 59 1/2
Am. Rad., pref.	135	Nat.-Acme, com.	33 - 33 3/4
Am. Ship, com.	73 1/2 - 75	Nat. En. & Stm., com.	33 1/2 - 34 1/2
Am. Ship, pref.	92 1/2	Nat. En. & Stm., pref.	96
Am. Steel Edries, com.	55 1/2 - 60	N. Y. Air Brake, com.	140
Bald. Loco., com.	52 1/2 - 56 1/4	Nova Scotia Stl., com.	99 1/2 - 100 1/4
Bald. Loco., pref.	100 - 100	Pitts. Steel, pref.	73 1/2 - 75 1/2
Beth. Steel, com.	130 - 135	Pressed Stl., pref.	102
Beth. Steel, class B	122 1/4 - 128 1/2	Ry. Steel Spring, com.	48 1/2 - 49 1/2
Beth. Steel, pref.	121	Ry. Steel Spring, pref.	97 1/2
Cambria Steel, com.	119	Republic, com.	77 - 80 1/2
Central Fdry., com.	26 - 28 1/2	Republic, pref.	101 1/2 - 10
Central Fdry., pref.	45 1/4 - 49 1/2	Sloss, com.	53 - 56 3/4
Ch/c. Pneu. Tool.	69 - 70	Superior Steel, com.	33 - 34 1/2
Colo. Fuel, com.	46 - 48 1/2	Sup. Steel, 1st pref.	99 - 100
Cruc. Steel, com.	60 1/2 - 64 1/2	Transu.-Williams, 41 - 41 1/2	
Cruc. Steel, pref.	108 1/2 - 109 1/2	Un. Alloy Steel, 42 1/4 - 43	
Deere & Co., pref.	98 - 98 1/2	U. S. Pipe, com.	18
Driggs-Seabury, com.	79 - 81	U. S. Steel, com.	109 1/4 - 113 1/2
Gen. Electric, com.	163 - 169 1/2	U. S. Steel, pref.	117 1/2 - 118 1/2
Gul. No. Ore Cert.	30 1/2 - 32 1/2	Val. I. C. & Coke, 64 1/2 - 70	
Gulf States Steel, com.	117 - 129	Westing. Elec., com.	48 - 50 1/2
Gulf S. Steel, 1st pref.	107 - 108		
Int. Har. of N. J., com.	113 1/4 - 118 1/4		

Dividends

The American Window Glass Machine Company, 12 per cent on the preferred, payable April 27.

The J. G. Brill Company, regular quarterly, 1 per cent on the preferred, payable May 1.

The Brier Hill Steel Company, regular quarterly, 1 1/2 per cent and extra 5 per cent on the common, and regular quarterly, 1 1/4 per cent on the preferred, payable June 20.

The Crucible Steel Company of America, 3 per cent on the preferred on account of deferred dividends. This leaves about 10 per cent yet to be paid.

The Taylor-Wharton Iron & Steel Company, regular quarterly, 1 1/4 per cent on the preferred, payable May 1.

General Electric's Profits

According to the twenty-fifth annual report of the General Electric Company, the profit for the period ended Dec. 31, 1916, amounted to \$15,294,091. The net income reached \$19,160,973. Orders received for electrical machinery and supplies were valued at \$167,169,058, an increase of 70 per cent over 1915. War munition orders amounted to \$2,416,000. Additions to manufacturing facilities cost \$8,828,254.

Dividend Deferred

On the recommendation of President Waddill Catchings, the directors of the Sloss-Sheffield Steel & Iron Company have voted to defer the quarterly dividend of 1 1/2 per cent due at this time on the \$10,000,000 outstanding common stock. The earnings will be used in developing the properties.

The Allis-Chalmers Company report for the year ended Dec. 31, 1916, shows a profit of \$2,902,312, an increase of \$2,171,217 over the previous year. The net profit equals \$19.18 per share on the preferred stock, as compared with \$6.53 in 1915. Sales amounted to \$19,440,509.

Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16.9c.; Philadelphia, 15.9c.; Boston, 18.9c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 32.9c.; Denver, 68.6c.; New Orleans, 30.7c.; Birmingham, Ala., 45c. Denver, pipe, 76.1c., minimum carload, 46,000 lb.; structural steel and steel bars, 83.6c., minimum carload, 36,000 lb. Pacific coast (by rail only), pipe, 65c.; structural steel and steel bars, 75c., minimum carload, 50,000 lb.; structural steel and steel bars, 80c., minimum carload, 40,000 lb. No freight rates are being published via the Panama Canal, as the boats are being used in transatlantic trade.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, 1/4 in. thick and over, and zees 3 in. and over, 3.60c. to 4c. Extras on other shapes and sizes are as follows:

	Cents per lb.
I-beams over 15 in.	.10
H-beams over 18 in.	.10
Angles over 6 in., on one or both legs less than 1/4 in. thick, as per steel bar card, Sept. 1, 1909.	.70
Tees, structural sizes (except elevator, handrail, car truck and conductor rail).	.05
Channels and tees, under 3 in. wide, as per steel bar card, Sept. 1, 1909.	.20 to .80
Deck beams and bulb angles.	.30
Handrail tees.	.75
Cutting to lengths, under 3 ft. to 2 ft. inclusive.	.25
Cutting to lengths, under 2 ft. to 1 ft. inclusive.	.50
Cutting to lengths, under 1 ft.	1.55
No charge for cutting to lengths 3 ft. and over.	

Plates.—Tank plates, 1/4 in. thick, 6 in. up to 100 in. wide, 4.50c. to 6c., base, net cash, 30 days, or 1/2 of 1 per cent discount in 10 days, carload lots. Extras are:

Quality Extras	Cents per lb.
Tank steel	Base
Pressing steel (not flange steel for boilers).	.10
Boiler and flange steel plates.	.15
"A. B. M. A." and ordinary firebox steel plates.	.20
Still bottom steel.	.30
Locomotive firebox steel.	.50
Marine steel, special extras and prices on application.	

Gage Extras

Rectangular, 1/4 in. thick, over 6 in. wide to 100 in. wide. Base	
Lighter than 1/4 in., to 3/16 in., up to 72 in. wide.	.10
Lighter than 1/4 in., including 3/16 in., over 72 in. to 84 in.	.20
Lighter than 1/4 in., including 3/16 in., over 84 in. to 96 in.	.30
Lighter than 1/4 in., including 3/16 in., over 96 in. to 100 in.	.40
Lighter than 1/4 in., including 3/16 in., over 100 in. to 102 in.	.45
Lighter than 3/16 in., including No. 8, up to 72 in. wide.	.15
Lighter than 3/16 in., including No. 8, over 72 in. to 84 in.	.25
Lighter than 3/16 in., including No. 8, over 84 in. to 96 in.	.35
Lighter than No. 8, including No. 10, up to 60 in. wide.	.30
Lighter than No. 8, including No. 10, over 60 in. to 64 in.	.35
Up to 72 in. and not less than 10.2 lb. per sq. ft. will be considered 1/4 in.	
Over 72 in. must be ordered 1/4 in. thick on edge, or not less than 11 lb. per sq. ft. to take base price.	
Over 72 in. wide, ordered less than 11 lb. per sq. ft., down to weight of 3/16 in., take price of 3/16 in.	
Over 72 in., ordered weight 3/16 in., take No. 8 price.	
Over 72 in., ordered weight No. 8, take No. 10 price.	

Width Extras

Over 100 in. to 110 in. inclusive.	.05
Over 110 in. to 115 in. inclusive.	.10
Over 115 in. to 120 in. inclusive.	.15
Over 120 in. to 125 in. inclusive.	.25
Over 125 in. to 130 in. inclusive.	.50
Over 130 in.	1.00

Length Extras

Universal plates 80 ft. long up to 90 ft. long.	.05
Universal plates 90 ft. long up to 100 ft. long.	.10
Universal plates 100 ft. long up to 110 ft. long.	.20

Cutting Extras

No charge for rectangular plates to lengths 3 ft. and over.	
Lengths under 3 ft. to 2 ft. inclusive.	.25
Lengths under 2 ft. to 1 ft. inclusive.	.50
Lengths under 1 ft.	1.55
Circles 3 ft. in diameter to 100 in.	.30
Circles over 100 to 110 in. (width extra).	.35
Circles over 110 to 115 in. (width extra).	.40
Circles over 115 to 120 in. (width extra).	.45
Circles over 120 to 125 in. (width extra).	.55
Circles over 125 to 130 in. (width extra).	.80
Circles over 130 in. (width extra).	1.30
Circles under 3 ft., to 2 ft., inclusive.	.55
Circles under 2 ft., to 1 ft., inclusive.	.80
Circles under 1 ft.	1.85
Half circles take circle extras.	
Sketches not over four straight cuts, inc. straight taper.	.10
Sketches having more than four straight cuts.	.20
Plates sheared to a radius take complete circle extras.	

*Including extra for width.

Wire Rods.—Including chain rods, \$85.

Wire Products.—Prices to jobbers, effective March 5: Fence wire Nos. 6 to 9, per 100 lb., terms 60 days or 2 per cent discount in 10 days, carload lots, annealed, \$3.15; galvanized, \$3.85. Galvanized barb wire and

staples, \$4.05; painted, \$3.35. Wire nails, \$3.20. Galvanized nails, 1 in. and longer, \$2.20 advance over base price; shorter than 1 in., \$2.70 advance over base price. Cement-coated nails, \$3.10. Woven wire fencing, 51 per cent off list for carloads, 50 off for 1000-rod lots, 49 off for less than 1000-rod lots.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card in effect from April 2, 1917, all full weight:

Steel			Butt Weld			Iron		
Inches	Black	Galv.	Inches	Black	Galv.	Inches	Black	Galv.
1/8, 1/4 and 3/8	48	21 1/2	1/4 and 1/2	36	9	1/4 and 1/2	36	9
1/2	52	37 1/2	3/8	37	10	3/8	37	10
3/4 to 3	55	41 1/2	1/2	41	22	1/2	41	22
			3/4 to 1 1/2	44	28	3/4 to 1 1/2	44	28
Lap Weld			Lap Weld			Lap Weld		
2	48	35 1/2	1 1/4	29	14	1 1/4	29	14
2 1/2 to 6	51	38 1/2	1 1/2	36	22	1 1/2	36	22
7 to 12	48	34 1/2	2	37	23	2	37	23
13 and 14	38 1/2	..	2 1/2 to 4	39	26	2 1/2 to 4	39	26
15	36	..	4 1/2 to 6	39	26	4 1/2 to 6	39	26
			7 to 12	38	25	7 to 12	38	25
Butt Weld, extra strong, plain ends			Butt Weld, extra strong, plain ends			Butt Weld, extra strong, plain ends		
1/8, 1/4 and 3/8	44	26 1/2	1/4, 1/2 and 3/8	35	18	1/4, 1/2 and 3/8	35	18
1/2	49	36 1/2	1/2	40	27	1/2	40	27
3/4 to 1 1/2	53	40 1/2	3/4 to 1 1/2	44	29	3/4 to 1 1/2	44	29
2 to 3	54	41 1/2						
Lap Weld, extra strong, plain ends			Lap Weld, extra strong, plain ends			Lap Weld, extra strong, plain ends		
2	46	34 1/2	1 1/4	30	15	1 1/4	30	15
2 1/2 to 4	49	37 1/2	1 1/2	36	22	1 1/2	36	22
4 1/2 to 6	48	36 1/2	2	38	25	2	38	25
7 to 8	44	30 1/2	2 1/2 to 4	40	28	2 1/2 to 4	40	28
9 to 12	41	25 1/2	4 1/2 to 6	39	27	4 1/2 to 6	39	27
			7 to 8	33	21	7 to 8	33	21
			9 to 12	28	16	9 to 12	28	16

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized, but in some sections of the country discounts on less than carloads are three (3) points less (higher price) than the carload discount on both black and galvanized steel pipe.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are four (4) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are five (5) points lower (higher price).

Boiler Tubes.—Nominal discounts on less than carloads, freight added to point of delivery, effective from Nov. 1, 1916, on standard charcoal iron tubes, and from April 2, 1917, on lap welded steel tubes, are as follows:

Lap Welded Steel	Standard Charcoal Iron
1 1/4 and 2 in.	1 1/4 in.
2 1/4 in.	1 1/4 and 2 in.
2 1/2 and 2 3/4 in.	2 1/4 in.
3 and 3 1/4 in.	2 1/2 and 2 3/4 in.
3 1/2 to 4 1/2 in.	3 and 3 1/4 in.
5 and 6 in.	3 1/2 to 4 1/2 in. No quotations
7 to 13 in.	5 and 6 in.
	7 to 13 in.

Above discounts apply to standard gages and to even gages not more than four gages heavier than standard in standard lengths.

Locomotive and steamship special charcoal grades bring higher prices.

1 1/4 in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets.—Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net, or 2 per cent discount in 10 days:

[Open-hearth stock, \$5 per ton above these prices.]

Blue Annealed—Bessemer

Nos.	Cents per lb.
Nos. 3 to 8.	4.95 to 5.95
Nos. 9 and 10.	5.00 to 6.00
Nos. 11 and 12.	5.05 to 6.05
Nos. 13 and 14.	5.10 to 6.10
Nos. 15 and 16.	5.20 to 6.20

Box Annealed, One Pass Cold Rolled—Bessemer

Nos.	Cents per lb.
Nos. 17 to 21.	5.55 to 6.65
Nos. 22 and 24.	5.60 to 6.10
Nos. 25 and 26.	5.65 to 6.15
No. 27.	5.70 to 6.20
No. 28.	5.75 to 6.25
No. 29.	5.80 to 6.30
No. 30.	5.90 to 6.40

Galvanized, Black Sheet Gage—Bessemer

Nos.	Cents per lb.
Nos. 10 and 11.	6.00 to 7.00
Nos. 12 to 14.	6.10 to 7.10
Nos. 15 and 16.	6.35 to 7.35
Nos. 17 to 21.	6.40 to 7.40
Nos. 22 and 24.	6.55 to 7.55
Nos. 25 and 26.	6.70 to 7.70
No. 27.	6.75 to 7.75
No. 28.	7.00 to 8.00
No. 29.	7.15 to 8.15
No. 30.	7.30 to 8.30

Tin-Mill Black Plate—Bessemer

Nos.	Cents per lb.
Nos. 15 and 16.	5.55 to 6.05
Nos. 17 to 21.	5.60 to 6.10
Nos. 22 to 24.	5.65 to 6.15
Nos. 25 to 27.	5.70 to 6.20
No. 28.	5.75 to 6.25
No. 29.	5.80 to 6.30
No. 30.	5.80 to 6.30
Nos. 30 1/2 and 31.	5.85 to 6.35

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York Lake	Electro-lytic	Tin, New York	Lead		Spelter	
				New York	St. Louis	New York	St. Louis
April 11	33.00	33.00	54.87½	9.35	9.15	10.25	10.00
12	32.50	32.50	55.00	9.35	9.15	10.00	9.75
13	32.50	32.50	55.00	9.35	9.15	10.00	9.75
14	32.00	32.00	55.25	9.35	9.15	9.75	9.50
15	31.00	31.00	55.25	9.35	9.15	9.75	9.50
17	30.50	30.50	55.25	9.40	9.20	9.75	9.50

NEW YORK, April 18, 1917.

Uncertainty as to the Government requirements still exercises an unsettling influence, and most of the metals are weaker. Copper is nominally considerably lower. Tin is quiet and a little higher. Lead is dull, with a tendency to stiffen. Spelter continues to decline on small offerings. Antimony is easier and lower.

New York

Copper.—A decided decline has occurred the past week. Sellers seem disposed to allow the market to fall, and because of their attitude, and an absence of demand, lower prices have resulted. Very little has been accomplished by this, so far as sales are concerned, and the quotation for both Lake and electrolytic yesterday was about 30.50c., New York, for near-by and April delivery, though some regard the quotation as higher. A sale, however, of a considerable quantity of spot electrolytic was made yesterday at 31c., New York. The explanation of the present lifeless and uncertain condition is that buyers are waiting to know the needs of both the Government and the Allies. The London quotation for spot electrolytic yesterday was £147, a decline of £4 from that of a week ago.

Tin.—The proposition of a Government tax of 10c. per lb. on pig tin has been the absorbing topic in the last few days. The opinion is general in the trade that Congress will turn down such a proposition as working against the interests both of the Government and of business in general. In the price of cans the tax itself would amount to practically nothing, but the burden would fall upon the tin dealer and the tin-plate maker. Usually such an announcement is enough to create a boom in the tin market, but nothing like this took place either yesterday or Monday. On the latter day a fair business was done, probably 150 tons in all positions, but on Tuesday the market became exceedingly quiet, with the bulk of business representing futures. The action of the market tends to confirm the opinion of the trade that while such a tax is possible it is hardly probable. The quotation for spot Straits yesterday was 55.25c., New York. The quantity afloat is reported as 2812 tons, with the arrivals to April 16, inclusive, as 1795 tons. Spot Straits was quoted in London yesterday at £217 17s. 6d.

Lead.—After a week of comparative dullness the market, early this week, stiffened slightly. The entire situation depends upon the amount of lead which the Government will require for both the army and navy and until this is known it is expected that the market will continue firm rather than otherwise. The slight strengthening this week is due to the fact that sellers having lead are holding back until they know something definite regarding the needs of the largest present market factor, about which nothing certain is yet known. Some small sales of future metal were made last week at 9c., New York, with prompt metal from the West at 9.25c., New York, but the quotation yesterday was 9.20c., St. Louis, or 9.40c., New York, for early delivery, with the leading interest still asking 9c., New York.

Spelter.—The quotation for spot and April spelter is 9.50c., St. Louis, or 9.75c., New York, though it is possible that a desirable offer would bring a price of 9.37½c., St. Louis. In the absence of any demand and because of the offerings of some sellers desirous of do-

ing some business, the market shows a weak and dull condition and is lifeless.

Antimony.—Because of somewhat freer offerings, spot Chinese and Japanese metal is now quoted at 34c. to 35c., New York. Demand is not as strong as it was.

Aluminum.—The market is unchanged at 59c. to 60c. for No. 1 virgin metal, 98 to 99 per cent pure, for early delivery.

Old Metals.—The market continues quiet. Dealers' selling prices are as follows:

	Cents per lb.
Copper, heavy and crucible	31.00 to 31.50
Copper, heavy and wire	30.00 to 30.50
Copper, light and bottoms	27.00 to 27.25
Brass, heavy	19.50 to 20.00
Brass, light	15.50 to 16.00
Heavy machine composition	25.75 to 26.25
No. 1 yellow rod brass turnings	19.50
No. 1 red brass or composition turnings	22.00 to 23.00
Lead, heavy	8.625
Lead, tea	8.25
Zinc	8.50

Chicago

April 17.—Consumers of copper are marking time both as to future and spot buying; meanwhile their needs are covered. The same situation exists in lead. Spelter is weak and shows a further decline, which is attributed to over-production and the great demand for black sheets rather than for galvanized sheets. We quote lower prices for most metals as follows: Casting copper, 30c.; Lake, 33c.; electrolytic, 32.50c.; tin, car loads, 55.75c., and small lots, 58c.; lead, 9.25c.; spelter, 9½c.; sheet zinc, 21c.; oriental antimony, slow at 38c. On old metals we quote buying prices for less than car load lots as follows: Copper wire, crucible shapes, 25.50c.; copper clips, 24c.; copper bottoms, 22c.; red brass, 22c.; yellow brass, 17c.; lead pipe, 8c.; zinc, 7c.; pewter, No. 1, 32c.; tin foil, 40c.; block tin, 45c.

St. Louis

APRIL 16.—Metals retain their firmness. The close to-day on carload lots of lead was 9.12½c.; spelter, 9.50c. In less than carload lots, the figures were: Lead, 9.75c.; spelter, 10.75c.; tin, 60c.; Lake copper, 34c.; electrolytic copper, 33.50c.; Asiatic antimony, 40c. In the Joplin district both zinc blende and galena slumped, bringing the top price for choice blende to \$80 per ton, with the range down to \$65, the average for the district for the week being \$73. Calamine ranged from \$40 to \$45, with the week's average \$43. Lead ore sold up to \$110, and the average for the week was \$109. High cost of labor and supplies is expected to put the sheet ground miners out of the running if the prices of ore go any lower. On miscellaneous scrap metals we quote as follows: Light brass, 12.50c.; heavy yellow brass, 13.50c.; heavy red brass and light copper, 19.50c.; heavy copper and copper wire, 23c.; zinc, 7c.; lead, 5.50c.; tea lead, 8.50c.; pewter, 25c.; tin foil, 36c.

Lackawanna Steel's Increased Earnings

The Lackawanna Steel Company has issued the following statement of its income account, including subsidiary companies, for the quarter ended March 31, 1917, compared with the same period in 1916:

	1917	1916
Earnings of all properties, after deducting all expenses, including repairs and maintenance, but not renewal expenditures and other appropriations for this year, deducted below	\$6,203,232.93	\$3,247,593.30
Deduct interest, rentals and royalties	373,919.79	504,621.50
Balance	5,829,313.14	2,742,971.80
Less appropriations for extinguishment of mines and mining investments, for depreciation and for accruing renewals	538,728.63	491,903.37
Profit	\$5,290,584.51	\$2,251,068.43

It will be observed that the earnings have increased this year \$2,955,639.63, or over 90 per cent, while the profit has increased \$3,039,516.08, or over 135 per cent.

The company further reports that its unfilled orders at the close of the first quarter were 992,096 gross tons, against 871,876 tons at the corresponding time last year.

Machinery and Supply Men at Memphis

Assisting the Government in War Preparations a
Vital Topic at Convention Sessions—Patriotism
Holds Sway—Qualifications of Salesmen Discussed

The triple joint convention of the American Supply and Machinery Manufacturers' Association, the National Supply and Machinery Dealers' Association and the Southern Supply and Machinery Dealers' Association, held at Memphis, Tenn., April 12, 13 and 14, was not as well attended as some of the previous meetings, but 400 were registered, of whom 267 were manufacturers or their representatives, and 133 were dealers.

The smaller attendance was attributed to the fact that in these times of stress and anxiety many business men are reluctant to make long journeys and be away from their desks, even for four or five days. H. E. Dickerman, Chisholm-Moore Mfg. Company, Cleveland, retiring president of the manufacturers, touched on this phase of the convention when he said in an address that the question had been raised a few weeks ago whether in view of the war, it would not be best to abandon the convention this year. Several felt, however, that the very fact of the war was all the more reason for the gathering. Throughout the proceedings of the associations patriotic expressions were frequent, and a spirit prevailed that everyone should give gladly and freely to help the Government in the present emergency. In line with this attitude, all three associations concurred in a resolution that the resources of the American National and Southern associations be placed at the disposal of the President of the United States for the prosecution of the war, and it was directed that President Wilson be notified of the action.

Officers Elected by Each Association

The following officers were elected:

American Supply and Machinery Manufacturers' Association: President, R. F. Valentine, Boston Woven Hose & Rubber Company, Boston; first vice-president, George T. Bailey, Oliver Iron & Steel Company, Pittsburgh; second vice-president, Charles E. McFarland, William Powell Company, Cincinnati; third vice-president, Charles W. Beaver, Yale & Towne Mfg. Company, New York City; executive committee, B. G. Waring, chairman, Yarnall-Waring Company, Philadelphia; E. P. Browning, Ohio Valley Pulley Works, Maysville, Ky.; A. H. Dillon, Youngstown Sheet & Tube Company, Youngstown, Ohio; J. H. Fisher, Fisher-Governor Company, Marshalltown, Iowa; Muir B. Snow, Detroit Twist Drill Company, Detroit; advisory board, Willard Parker, chairman, Pennsylvania Shafting Company, Spring City, Pa.; N. A. Gladding, E. C. Atkins & Co., Inc., Indianapolis; D. K. Swartwout, Ohio Blower Company, Cleveland; Farnham Yardley, Jenkins Bros., New York City; H. E. Dickerman, Chisholm-Moore Mfg. Company, Cleveland; secretary-treasurer, F. D. Mitchell, 4106 Woolworth Building, New York City.

National Supply and Machinery Dealers' Association: President, H. W. Strong, Strong, Carlisle & Hammond Company, Cleveland; first vice-president (in charge of machinery interests), W. J. Radcliffe, E. A. Kinsey Company, Cincinnati; second vice-president, Crannell Morgan, the Hardware & Supply Company, Akron, Ohio; secretary-treasurer, Thomas A. Fernley, Philadelphia; advisory secretary-treasurer, T. James Fernley, Philadelphia; executive committee, W. T. Todd, Somers, Fidler & Todd Company, Pittsburgh; George Vonnegut, Vonnegut Hardware Company, Indianapolis; E. B. Hunn, C. E. Mersick & Co., New Haven, Conn., and J. D. Nicklis, Manning, Maxwell & Moore, Inc., New York City.

Southern Supply and Machinery Dealers' Association: President, George H. Manning, Tennessee Mill & Supply Company, Knoxville, Tenn.; first vice-president, W. P. Simpson, C. T. Patterson Company, New Orleans; second vice-president, W. J. Schaefer, Russell Hardware Company, McAlester, Okla.; chairman of the executive

committee, Ernest Howell, Capitol City Supply Company, Charlestown, W. Va.; chairman of the textile committee, F. W. Glover, Charlotte, N. C.; member of the executive committee, W. M. Turner, Turner Supply Company, Mobile, Ala.; secretary-treasurer, Alvin M. Smith, Smith-Courtney Company, Richmond, Va.

All of the officers of the National Association were re-elected with the exception of A. M. Maddock, whose place on the executive committee was taken by J. D. Nicklis. An unsuccessful effort was made to have Crannell Morgan, of Akron, take the presidency, but it is expected he will do so next year. No changes were made in the secretaryships.

First Joint Session a Patriotic One

The opening meeting was attended by the members of all three associations, and was called to order by R. F. Valentine as chairman of the entertainment committee. The address of welcome on behalf of the city was made by Judge James M. Greer. Responses were made by several, including George Puchta, Queen City Supply Company, Cincinnati, who said a meeting had never been held in more trying times than those of the present, and he asked that the conventions give serious thought to what they could do for the Government. J. G. Christopher, J. G. Christopher Company, Jacksonville, Fla., a charter member of the Southern Association, said that business, in many instances, would be badly disrupted by the calling of young men to the colors, but he hoped that all would recognize that it was the duty of the young men to go, and that those within his voice should be willing to spend the last dollar they had, if necessary, to secure the freedom of America and Europe. Other addresses were made by Messrs. Strong and Dickerman, of the National and American associations, respectively. Senator James E. Watson of Indiana was on the program for an address on the tariff, but could not be present because of the national crisis.

Secretary-Treasurer Alvin M. Smith of the Southern Association, in the course of a general discussion that followed the address, declared that the jobbers of supplies in Richmond had not taken advantage of the opportunity which confronted them, and that prices so low as to be unwarranted, considering conditions, were the rule; the jobbers giving as their reason that they had bought their stocks cheap, and that jobbers in Baltimore would not let them make a profit. Those making the low prices evidently overlooked the fact that they can only replace their goods at high prices.

Charles S. Farquhar, Chandler & Farquhar, Boston, said that New England was prosperous and had met none of the conditions to which Mr. Smith referred. He said a time will come when the jobbers will have to take losses, and he believed they should now prepare themselves against that day. He also said he believed it the duty of all to assist the Government by offering their stocks and in such other ways as presented themselves.

John Trix, American Injector Company, Detroit, referred to the very large output of automobiles in that city, and asked the delegates to consider what the mechanics in the automobile plants can do when they start in producing ammunition. He said the present war is one of mechanics; that the fighting is done with machinery, and that none can excel the engineers and mechanics of the United States when they are put to the test. It was his opinion that the problem of successfully combating the submarine will be solved in this country. If there must be war, said Mr. Trix, let us go into it with all our might.

T. James Fernley, of the National Association, said

that he believed the people throughout the country were alive to the stupendous issue before them, and that manufacturers conceded the demands of the government must be met first of all. His association is in touch with the war and navy departments.

Frank F. Blakely, C. M. McClung & Co., Knoxville, Tenn., said the people of Tennessee stood ready to support President Wilson and the Flag. Edward P. Welles, Charles H. Besly & Co., Chicago, said that his city would do its part in the way of military preparations, and he thanked all those who had assisted his firm at the time of its disastrous fire, Jan. 13, last. At that time his competitors and neighbors came to his assistance with the result that the firm was doing business within a few hours after the fire.

J. O. Buford, Peden Iron & Steel Company, Houston, Tex., said that those in his vicinity had enjoyed a good year, and that to say that prices had been sustained was putting it mildly and that only in a few lines had the jobbers suffered because of non-delivery. The dealers had large stocks of pipe when the troops were on the Mexican border, and with the assistance of the railroads these had been of material assistance to the Government for supplying water to the troops. He said the war must be regarded seriously, and the young men released from industry without regret. J. C. Miller, Miller Supply Company, Huntington, W. Va., said that conditions in the interior, with regard to prices and unfair competition, were not as bad as on the Atlantic seaboard. E. E. Strong, Strong, Carlisle & Hammond, Cleveland, said the delegates must to a large extent forget their personal business and stand behind the Government to see that the war is successfully ended.

Wants Government to Permit Price Regulation

David C. Jones, Lunkenheimer Company, Cincinnati, said his city was unquestionably the greatest machine-tool center in the country. He knew the builders had an understanding among themselves as to what they would do for the Government when called upon, but did not know that they had any definite understanding with the Government. He said that sooner or later manufacturers will be confronted by a serious readjustment in prices.

Crannell Morgan, Hardware & Supply Company, Akron, said that most of the plants in his city were working night and day, usually in three shifts, and that at least one important plant would be taken over by the Government. Other brief talks were made by W. P. Simpson of New Orleans, W. J. Schaefer of McAlester, Okla., and others, all of patriotic tenor.

The American Association

At the Thursday afternoon session of the American Association, John Trix occupied the chair and urged a general discussion on efficiency in making sales. First, however, a report was received from Charles W. Beaver, as chairman of the export committee of the association. In part the report was as follows:

Based on experience during the past 12 months, your committee can heartily recommend the following associations and Government departments, all of which can be of great assistance to the American manufacturer in the export field. Those members of our association who are interested in export trade could not do better than become members of the first five following mentioned associations:

American Asiatic Association, 280 Madison Avenue, New York City.

American Manufacturers Export Association, 160 Broadway, New York City.

Japan Society, 165 Broadway, New York City.

National Association of Manufacturers, 30 Church Street, New York City.

National Foreign Trade Council, 1 Hanover Square, New York City.

Pan-American Union, Seventeenth and B streets, N. W., Washington, D. C.

Department of Commerce and Labor, Bureau of Foreign and Domestic Commerce, Washington, D. C.

Philadelphia Commercial Museum, Philadelphia, Pa.

To those members who are interested in making a beginner's study of the export problem, your committee recommends the course on export selling by the Business Training Corporation of 185 Madison Avenue, New York City.

Those members who are interested in the protection of trademark rights in the various foreign countries will find valuable data in the pamphlet called "Trade Marks and World's Trade," issued by Lawrence Langner, foreign patent attorney, 55 Liberty Street, New York City.

During September and October, 1916, the American Manufacturers' Export Association sent the American Industrial Commission to France to study the requirements of France with relation to American Manufacturers after the war. The

report of this commission has recently been published and is now available with the American Manufacturers Export Association, of 160 Broadway, New York City. Those of our members who are interested in export trade with France will find this an interesting volume and one which will be of value in connection with future plans for export trade with France.

At the time of the fourth annual convention of the National Foreign Trade Council in Pittsburgh, on Jan. 27, 1917, the following papers were contributed and copies should be available from the secretary of the National Foreign Trade Council at 1 Hanover Square, New York City. These papers contain valuable information for the American manufacturer interested in export trade:

"Problems of the Smaller Manufacturer and Merchant in Foreign Trade."

"World Trade Conditions After the European War."

"American Banking in Foreign Trade," by Louis E. Pearson, chairman, Irving National Bank, New York.

"The Foreign Trade Aspects of

the Tariff," by Willard Straight, vice-president American International Corporation, New York.

"An Inquiry into Credit Conditions in Latin-America," by C. E. McGuire, assistant secretary-general, International High Commission.

The Governing Board of the Pan-American Union comprises the Secretary of State of the United States and the ambassadors, ministers and chargés d'affaires of twenty Latin-American countries. The monthly bulletin of the Pan-American Union is obtainable by subscription from Washington, D. C. This bulletin is of vital interest to our members who are selling or contemplating selling to Latin-American countries.

Your committee recommends for your attention the "Report on Co-operation in American Export Trade," by the Federal Trade Commission, dated June 30, 1916. This report is in two parts, and can be obtained from the Government Printing Office in Washington.

Praise for National City Bank

The report was highly commended, and on motion of D. K. Swartwout, Ohio Blower Company, Cleveland, was accepted and ordered printed for circulation among the three associations. Mr. Trix declared this a wasteful nation, and expressed the hope that we will learn how to market our surplus production of normal times. He said we are too well satisfied with ourselves and that we should take a few leaves from the German book; also that now is the time to go for export trade. He gave praise to the National City Bank, and to Frank A. Vanderlip, its president, for starting branch banks in South America.

John K. Broderick, Broderick & Bascom Rope Company, St. Louis, told of the work being done in his city through the medium of an organization of sales managers which has been in existence about nine years. He also urged vocational schools. Mr. Swartwout made the



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statement that the modern man of possibilities can command an attractive price. He spoke of the importance of men not only well schooled, but clean in person and morals, if they would be successful salesmen. Incidentally he stated that quality and service are invincible, and he was sometimes inclined to believe that service was the more important.

Mr. Trix said that whatever is sold to the foreign buyer should be "19-karat," otherwise the American manufacturer is likely to be denounced as a fraud, and not only the manufacturer but the entire American public be disliked.

John T. Bulkley, Jenkins Bros., New York, spoke of the need of clean, sober young men in selling, and said that in his belief salesmen are born and not made. He did not believe that the employer could always judge from appearances, and cited a few cases where young men, at first unprepossessing, had made good. Other topics touched on were the desirability of manufacturers manufacturing rather than exporting raw materials; our inadequate merchant marine, the need of additional foreign banking facilities, and the establishment of a trading tariff.

C. W. Beaver, Yale & Towne Mfg. Company, New York, expressed the view that in the matter of salesmanship it was desirable to get the right man and then "give him his head." He said that the Southern and Central American countries are now sending many of their young men to this country to be educated instead of to Europe as formerly, and he believed it to be important that these young men should be encouraged and assisted in every way possible.

M. L. Bailey, Union Mfg. Company, New Britain, Conn., said his principal effort in the past two years has been endeavoring to stop business rather than get it. He said, incidentally, that 55 per cent of the ammunition made in the United States is manufactured in Connecticut. Lewis B. Curtis, Curtis & Curtis Company, Bridgeport, Conn., stated he believed the problems of the big business executive are solved with less difficulty than are those of the small manufacturer for the reason that the latter had to do the thing himself whereas the head of a big corporation can relegate the work to a high-priced department head.

Knowledge Essential to Efficiency

Edward Ingalls, Atha Tool Company, Newark, N. J., touching on the subject of salesmen's expenses, said he did not care whether he expended \$10 or \$100 if a proportionate amount of business was secured, and obtained as a gentleman should get it. He had made up his mind that perhaps the most important thing in a salesman was a profound knowledge of his line; in fact, he considered this a most potent factor in the development of efficiency. At this point a member declared with considerable emphasis that salesmen had made more manufacturers than manufacturers had made salesmen.

Major D. C. Williams, Chicago Nipple Mfg. Company, Chicago, said that it was his belief that salesmen are born, and not made; just as are the best lawyers, physicians and other professional men, yet he believed certainly they could be improved by careful tutoring.

Address by A. A. Ainsworth

At its afternoon session of Friday the manufacturers were addressed by A. A. Ainsworth, New York, secretary of the Pipe Fittings and Valve Exchange, who emphasized the importance of correctly ascertaining manufacturing costs through standardization of cost systems used by manufacturers in similar lines; in other words, co-operation in respect to information bearing on costs. He said the Government is more favorably disposed toward manufacturers than it formerly was, and expressed the opinion that the Webb bill probably will pass at this session of Congress.

The subject of salesmen was taken up again, and discussion was had on the time which travelling representatives are often forced to wait for an audience, often despite the fact that they had sent advance information of their coming. No solution was found.

After considerable discussion the manufacturers adopted the following resolution, its subject being one on which the jobbers have long sought action:

"Resolved, The American Supply and Machinery Manufacturers' Association recommends to its membership that after Jan. 1, 1918, all changes in list prices be announced and be made effective, as far as possible, on a definite date, and that the date of such change or changes and announcements thereof be as of Jan. 1 of each year."

It was pointed out, as at previous conventions, that no sooner does a jobber have his catalogue printed, than price lists begin to change and the value of the catalog is seriously impaired.

The National Association

President H. H. Strong presided at the first meeting of the National Association of Supply and Machinery Dealers, which was called to order Thursday afternoon. In the course of his opening address he said:

"There has been a very considerable concern in the past year as to the business conditions under which we would labor at the close of the war. England has become so much more efficient in the past two and a half years, and is now, according to the best authority, leaning so strongly toward a protective tariff, that there has been a considerable feeling that the Declaration of Paris tending to make a hard and fast commercial alliance between the Entente Allies for a period of 10 years after the war will work a source of hardship on this country unless steps are taken to counteract such conditions in the very near future. With our own advent into the war, however, this seems to be one of the projected difficulties which will not accrue—in other words, it is fair to assume that we may be participants in the convention which drew up the Declaration, and in any event it is a subject which will require much investigation before any action is taken."

Would Abandon V Threads

Mr. Strong also said: "The general attitude of manufacturers is favorable toward working away from the V thread standard in favor of the U. S. standard. There are a number of them who have discontinued stocking V thread screws, and they now make an extra charge for any V thread screws, except such as they happen to have left in stock. Some companies feel that the initiative in this movement should come from the consumer. They regard their function as being that of furnishing what is asked for and not what they consider best. There is, of course, reason in their point of view, but we hope that they may come in line a little later on."

Mr. Strong advanced the suggestion that the annual convention be held in the fall instead of the spring, his reason being that the two or three months which follow the convention should be active in the matter of association work, but they are warm months and it is almost impossible to get anyone to take on more work than he is actually obliged to do. Later in the meeting a committee was appointed to confer with the other associations on this subject. He advocated October. The membership has been increased by 31 in the year, making a total of 134.

The report of Secretary-Treasurer Thomas A. Fernley reviewed the activities of his office in the past year. Many subjects have been dealt with, and the members kept apprised of the progress made by correspondence. Much valuable information has been exchanged. He said that in February, President Strong upon the approval of the members of the executive committee, telegraphed President Wilson expressing comment and approval, and on April 2 President Strong addressed letters to the Secretary of the Navy and to the Secretary of War, placing the services of the association at their disposal for the location of needed merchandise which could not be found through the ordinary channels.

The association took up a number of topics of intimate concern to the members on which there was the usual lively discussion. Crannell Morgan spoke on cash discounts or premiums. The members of the association are on record, as Secretary Fernley pointed out, as favoring a premium of 2 per cent to those who comply with the manufacturer's terms under which the premium is offered. On this subject, Mr. Fernley had said:

"Some manufacturers have felt that this is probably a good time to withdraw this premium and remove from the buyer all incentive to promptly pay his bills. The members of this association are anxious to see the cash premium of 2 per cent perpetuated. One important reason is that it is considered necessary to buy merchandise on the same terms as those on which it is sold. The 2 per cent premium is a valuable guide in the extension of credit to those of limited fixed financial responsibility."

The subject was left, to be taken up with the manufacturers. A committee was appointed to consider revising the present system of recording comparative past prices of supplies. There also was discussion on the merits of profit-sharing systems in jobbing houses.

Believe It Safe to Carry Normal Stock

On the question of whether or not it is wise to buy heavily under present conditions, the general opinion was that there are no indications as yet of the inadvisability of keeping stocks up to normal volume. It was agreed that manufacturers are keeping faith to the best of their ability, and that they were not favoring buyers with whom they do not have contracts. E. E. Strong contributed to the discussion on this point and spoke of an instance where the checking up of unfilled orders had resulted in a favorable showing for the manufacturers. Charles Bond declared that the American manufacturer is entitled to credit for his high moral attitude.

At the Friday afternoon session, George Puchta, for the committee on comparative prices, reported that the present system should be continued except in centers where more than one firm reports, and at those places that only the high and low figures be given on each commodity.

Crannell Morgan reminded the members that they are doing a larger business in dollars and cents, but are really doing less when volume of merchandise is considered. He also made the point that selling expenses are higher, and said that houses which are not decreasing their selling expense in accordance with the increased cost of merchandise are on dangerous ground. H. W. Strong said that values had increased 50 per cent as compared with two years ago. George H. Morris, E. H. Morris & Co., Cincinnati, said he was more interested in quantity reports of sales than in the monetary side, as less is being sold now than in normal times.

The trade acceptance was among the several subjects taken up, and it developed that the National jobbers are not in favor of the system, evidently fearing that it will interfere with the cash discount or premium. President Strong said the time is not yet ripe for the association to indorse the plan. Charles Bond urged economies in conducting business, inasmuch as jobbers have to pay higher wages with no increased productiveness of the labor. He also urged economies in space, and the employment of labor saving appliances. Edward P. Welles, Charles H. Besley & Co., Chicago, spoke of proper arrangements of stock.

Mr. Welles referred to the importance of keeping insurance on plants and warehouses up to a fair cash value, rather than basing it on inventory value. He suggested that policies be confined to American companies.

The National Association decided to hold its next convention at Cleveland, Ohio.

The Southern Association

Secretary-Treasurer Alvin M. Smith, reporting to the Southern Supply and Machinery Dealers' Association, touched on many subjects of concern to the jobber. Among other things, he said:

"The troublous times through which we are now passing should encourage us to conserve our resources to the limit, to practice economy in our private and business life; to be prepared to make any sacrifices.

"Despite the fact that at our last convention the card base price f. o. b. Pittsburgh on wrought pipe, sizes $\frac{3}{4}$ to 3 in. black, was 70 per cent and it has steadily advanced until to-day it is 55 per cent off, the pipe situation seems to be in a demoralized state. Jobbers who have followed the three and four-point

advance on black and galvanized did not seem to realize until last November that as pipe steadily advanced and they in turn continued using the three and four-point advance, their profit was becoming correspondingly lower. In November four and five points advance was made, but it has failed to take care of the steady advance on pipe, and until now those jobbers who sell on that plan are not beginning to get the profits to which they are entitled.

"In some sections I find jobbers who are getting an adequate profit on their pipe by ignoring any arbitrary advance in points on the base and using a flat gross profit price above their actual cost, and such jobbers are enjoying the fruits of the many pipe advances.

"In other sections the market is wide open and the jobbers are falling over themselves trying to see how much under their market cost they can sell their pipe. Now most of the mills claim that they are not only getting further behind on their orders on tubular goods (in fact, practically all of them have discontinued accepting orders for boiler tubes), but the situation is becoming worse on both butt and lap weld sizes, and they doubt their ability to continue to fill orders with any degree of promptness; so, under the circumstances, it would certainly seem to be good policy for every member of this association to base his selling prices on tubular goods upon the market card issued by the manufacturers, getting an adequate advance above that card to take care of the future situation. We are still endeavoring to have the minimum carload weight on wrought pipe east of the Mississippi and Ohio rivers raised from 36,000 to 46,000 lb. Bitter complaints also reach me regarding the situation on cast iron and malleable fittings, which commodities have also advanced very much and are being sold entirely too cheap."

Address on Trade Acceptances

On Friday morning a second joint session of the three associations was held, the feature of the meeting being an address on "Acceptances" by Lewis E. Pierson, chairman of the board, Irving National Bank, New York. The manufacturers and jobbers were plainly interested in Mr. Pierson's exposition of his subject, and at its conclusion asked a number of questions. In part he said:

"It might be said of the acceptance that it operates in the interest of banking and of general finance, because it makes better business, creates a better class of accounts, develops a keener sense of obligation, insures more prompt attention to payments when due, and, in general, tends toward the elimination from financial transactions of many of the elements of difficulty and annoyance which now embarrass them. It might be said that it operates in the favorable interest of general business because of the check which it provides against carelessness, recklessness and extravagance; because of the constant suggestion it brings to the debtor of the fact that if he does not meet his obligations promptly when due his credit will be put to the test. It is believed though that its greatest significance and fullest justification are to be found in a theory larger, more important, more filled with meaning for us just now than in any of these referred to—the theory of national preparedness. No reference is had to military or naval preparedness, as consideration of these consistently may be left to others. The preparedness referred to is the not less important though, unfortunately, less discussed and less understood phase of the subject—financial-commercial preparedness.

"In the entire list of methods and expedients commonly employed in the class of business which is conducted upon a credit basis, I know of none more safely founded, more logically arranged, more economical in operation, or better calculated to protect the proper interests of all parties concerned, than the trade acceptance. Its plan of operation is simple in the extreme and its understanding need not be in the least difficult unless we bring into its discussion elements which, while they may affect transactions out of which the trade accept-

ance comes, are no part of the acceptance itself and should be considered, if at all, in an entirely separate connection. I refer to cash discounts, trade discounts and other details which, after all, are only trade arguments or trade inducements employed in the consummation of the transaction upon which the trade acceptance is based.

"The trade acceptance has no quarrel with any respectable trade or commercial method which is being properly employed. Its path and that of the cash discount never need cross. If the purchaser, in settlement, is allowed an option between accepting a discount for cash and signing an acceptance, he can take his choice and leave the other. If the seller, in his efforts to impress customers with the merit of the acceptance and its business value, offers discount inducements conditional upon its use, the case is equally clear and there need be no conflict of methods. If the seller, in his sales campaign, uses the trade discount as an argument or an inducement, it is his privilege to do so. In such case, the use of the acceptance is entirely practicable. It will be necessary only that discount arguments, inducements and arrangements be fully completed before the acceptance arrangement begins. In other words, the acceptance will not enter the field until every process of bargaining has been consummated. It serves a definite purpose and deals with definite things, after a business conclusion has been reached."

Two Per Cent Discount Again

Discussion on various topics brought the meeting to a close. One subject was the difficulty of contending with large mail order houses which own or control factories. The manufacturers' agent who undersells the jobber was also declared a thorn in the side of the jobber, likewise mill supply purchasing agents who want the manufacturers to give them prices similar to those made for the jobber.

The cash discount came in for more attention. President H. W. Strong of the National Association said one reason the jobber wants the cash discount is because he makes so many small sales, and it serves to hurry up settlements. Those who take the discount are regarded as preferred customers.

A manufacturing delegate said he believed 2 per cent too much for 10 days, while another pointed out that sometimes the 10 days was lengthened to 50 days. T. James Fernley arose to say he preferred the term "cash premium," and that all dealers should live up to the terms of sale, that being the policy of the National Association members. He said to ask for the 2 per cent after the expiration of 10 days was as bad as offering to settle for 95c. on the dollar.

A resolution offered by George Puchta that all manufacturers should adhere to the 2 per cent discount was carried.

Convention Notes

H. E. Dickerman, retiring president of the American Supply and Machinery Manufacturers' Association, was presented by C. W. Beaver, on behalf of the association, a shotgun specially designed for trap shooting, in which sport Mr. Dickerman holds high rank as an amateur shot. The popularity of Mr. Dickerman was demonstrated by the prolonged applause with which he was greeted when he opened the proceedings of his association. President H. W. Strong of the National Association was presented a set of fancy chinaware, the spokesman being George Puchta, Cincinnati.

The nominating committee of the manufacturers consisted of: N. A. Gladding, E. C. Atkins & Co., Inc., Indianapolis; D. K. Swartwout, Ohio Blower Company, Cleveland; Frederick Pease, Charles Parker Company, Meriden, Conn.; A. B. Peck, American Screw Company, Providence; H. S. Madden, Sherwood Mfg. Company, Buffalo; A. H. Dillon, Youngstown Sheet & Tube Company, Youngstown.

The ninth semi-annual meeting of the American Institute of Chemical Engineers will be held in Buffalo, N. Y., June 20 to 22, 1917.

General Labor Notes

The Fore River Shipbuilding Corporation, Quincy, Mass., has announced to its employees that it is arranging a general increase in wages to go into effect June 1. President Powell states that the company is establishing new records in its efforts to hurry the construction of United States naval vessels.

The American Tube Works, Somerville, Mass., a large manufacturer of brass tubing, has closed its plant indefinitely, following a strike of several hundred of its 800 employees. The men demanded an 8-hr. day and a 25 per cent increase in wages.

The Reading Iron Company, Reading, Pa., has announced a raise in wages taking effect April 11. It will be the ninth consecutive advance in the wages of puddlers, this last raising them from \$8.50 to \$9.25 per ton. This is the highest rate of pay for puddlers in the history of the iron trade in the Schuylkill Valley.

Beginning May 1, according to an announcement from South Bethlehem, a 10 per cent increase in wages will be given workmen of the Bethlehem Steel Company. The number of employees involved is about 50,000, located at Bethlehem, Redington, Titusville, Lebanon, Reading and Steelton, Pa., and at Sparrows Point, Md., and New Castle, Del. Since last August a total wage increase of 50 per cent has been granted, this installment being the fifth.

Effective May 1, an advance of about 10 per cent in wages will be granted to employees of the McKeesport Tin Plate Company, McKeesport, Pa. These employees have received through E. R. Crawford, president, a communication from William C. Redfield, Secretary of Commerce, appealing to their patriotism to continue at work as much as possible, and aid the Government by getting out a maximum output of tin plate, to be used in making cans.

The plant of the Standard Steel Car Company, New Castle, Pa., has been closed as the result of a strike of foreign workmen. The men demanded a heavy advance in wages, which the company refused to grant.

The strike of the boilermakers, riveters and helpers employed by the Harlan & Hollingsworth Corporation, Wilmington, Del., has been settled.

The Webster Mfg. Company, Tiffin, Ohio, announces that, beginning May 1, it will pay a service bonus of 50 per cent to all employees, except foremen, who continue in its employ three months. This is in addition to the present rate and bonus.

The United States Court at Indianapolis has issued an injunction forbidding the International Molders' Union to picket the plant of George B. Limbert & Co., East Chicago, manufacturers of power plant appliances. The strike affected only the molders and core-makers, about 100 in all, and, it is alleged, since the strike has been on pickets have sought by intimidation to prevent other men from working in the factory.

The Pioneer Iron Company, Gladstone, Mich., has announced an increase of 10 per cent in the wages of men employed at its blast furnaces at Gladstone and Marquette, Mich., effective May 1.

Manufacturers Favor Suspension of Labor Laws

The board of directors of the National Association of Manufacturers recently indorsed the resolutions drafted by the Committee on Conservation and Welfare of Workers and approved by the Advisory Commission of the Council of National Defense.

Since these resolutions refer only to the suspension of State labor laws, however, a supplemental recommendation was telegraphed to Howard E. Coffin, chairman of the Advisory Commission, in the following resolution:

"That the Council of National Defense recommend to the Congress of the United States, before adjournment, that it authorize the President of the United States to suspend or modify restrictions contained in the Federal labor laws when such suspension or modification shall be requested by the Council of National Defense, such suspension or modification to continue for a specified period, but not longer than the duration of the war."

Labor Scarcer and Products Tend Higher

(Continued from page 961)

1918, the existing law allows an exemption of \$5,000 and 8 per cent on invested capital and levies 8 per cent tax on the remainder of the profits of corporations and partnerships. If this tax, allowing the same exemptions, were increased to 10 per cent on profits in excess of 8 per cent and not over 15 per cent of capital invested; to 15 per cent on profits in excess of 15 per cent and not over 25 per cent of capital invested; to 20 per cent on profits in excess of 25 per cent and not over 50 per cent of capital invested, and to 25 per cent on profits in excess of 50 per cent of capital invested, the law would yield \$425,000,000.

Other sources, the Secretary believes, could be made to yield additional income as follows: Duties on articles now admitted free, \$206,000,000; excise tax on sugar, \$92,000,000; refined petroleum, \$75,000,000; stamp taxes on theater, baseball and other amusement tickets, \$75,000,000; increase in distilled spirits tax from \$1.10 to \$2 per gallon, \$73,000,000; rectified liquor, \$12,500,000; wines, etc., \$6,750,000; soft drinks, \$19,200,000; denatured alcohol, \$5,000,000; stamp taxes, Schedules A and B, \$51,600,000; increase in beer tax from \$1.50 to \$2, \$30,000,000; smoking and chewing tobacco, \$25,000,000; cigarettes, \$17,000,000; cigars, \$11,600,000; special tax on retail dealers in cigars, cigarettes, etc., \$4,800,000; wholesale dealers and jobbers in tobacco, \$2,500,000; dealers in snuff, \$1,500,000; freight transportation receipts, \$100,000,000; passenger tickets, \$35,000,000; automobile, truck and motorcycle licenses, \$19,800,000; excise tax on musical instruments, graphophones, etc., \$9,000,000, and excise tax on glucose, \$6,000,000.

The freight transportation tax is based upon the charge of 1 cent on each 25 cents or fraction thereof on each freight bill, while the proposed revenue from passenger transportation is estimated at 1 per cent on each 25 cent fare or fraction thereof, fares of less than 25 cents being exempt from tax.

The Ways and Means Committee has already begun preliminary work on the revenue bill, which will probably be reported to the House in about two weeks. Full consideration will be given the measure in both houses, but the disposition is to expedite its passage in order that it may be sent to the President for signature by May 15.

Bids on Submarines Received

Bids for 38 submarines, authorized by the naval appropriation act, were opened at the Navy Department April 11, and indicate that a patriotic spirit animates the shipbuilders of the country for, in spite of the very large amount of commercial work on hand, the proposals submitted promise to take care of the Government's requirements. The details of the opening follow:

Proposals for Submarine Torpedo Boats Nos. 109 to 146

Class A—Department's design.

Class B—Department's general specifications, modified, with bidder's design.

Electric Boat Company, 11 Pine St., New York, N. Y.

Class B, to be constructed at works of Union Iron Works Co., San Francisco, Cal., or Fore River Shipbuilding Corporation, Quincy, Mass.

Eighteen or more vessels, 1 in 16 months, 2 additional in 17 months, 3 additional in 18 months, 4 additional in 19 months, and thereafter at the rate of 5 per month up to and including 22nd month, and thereafter at rate of 6 per month; For boats constructed on Atlantic Coast, each.....\$1,524,000
For boats constructed on Pacific Coast, each.....1,592,000

Alternate bid: Basis of cost to company, including overhead, plus 15 per cent.

California Shipbuilding Company, Long Beach, Cal.

Not less than 4 nor more than 8 vessels of following designs

Class A, Government design with Busch-Sulzer Bros. 2-cycle engines, or

Class B, Designs 30-A, 30-A-1, or 30-B of company's

licensor, Lake Torpedo Boat Co. of Maine, on basis of cost plus percentage; completion at earliest practicable date consistent with conditions of labor and material market.

Proposals subject to award of contracts on same type to company's licensor, Lake Torpedo Boat Co. of Maine.

Lake Torpedo Boat Company, Bridgeport, Conn.

Class A, not less than 4 nor more than 8 boats, 857 tons, on basis of cost plus percentage to be determined by Compensation Board appointed by Secretary of the Navy; delivery on earliest date practicable.

Class B, not less than 4 nor more than 8 boats, 800 tons, 16 knots surface speed, 11 knots submerged speed, first boat in 24 months, successive boats at intervals of 1 month thereafter.

Design 30-A, each.....\$1,288,000

Design 30-A-1, each.....1,290,000

Design 30-B, each.....1,299,000

Or build same number of company's design on basis of cost plus percentage.

And license department to construct a submarine on any of above designs at Atlantic Coast Navy Yard, for \$100 per ton of net designed submerged displacement.

Schneider & Company, of France, Represented by Mr. E. Collin, 44 Whitehall Street, New York, N. Y.

License department to construct submarine torpedo boats, furnishing plans, specifications, etc., for first vessel, \$65,000; each succeeding vessel, \$45,000.

Or for licensing construction of heavy oil, first vessel, \$35,000; each succeeding vessel, \$25,000.

Proposals for Shells

The Navy Department, also, opened proposals for approximately 1,600,000 shells of various calibers, ranging from one pounder rapid fire up to 16-in. naval rifles. All parties not directly interested in the bids were excluded from the opening. The bids were divided into two classes, covering service projectiles and those designed only for target practice. The proposals covering service projectiles are still held in confidence, but those covering target projectiles have been made public. The latter class include 3000 14-in. shells, 2500 12-in., 2000 8-in., 10,000 5-in., 5000 4-in. (Mark VII), 2000 4-in. (Mark V-1), 10,000 3-in. and 100,000 1-pounder. The bids were as follows:

Vermont Farm Machine Company, Bellows Falls, Vt., 5-in., \$2.50 each; 1-pounder, 60c.

The Baldwin Locomotive Works, Philadelphia, Pa., 14-in., \$142.50 each; 12-in., \$101; 8-in., \$44; 5-in., \$19.50.

Poole Engineering & Machine Co., Baltimore, Md., 1-pounder, 37c. each.

Worthington Pump & Machinery Corporation, New York City, 1-pounder, 66c. to 70c. each.

Hardie-Tynes Mfg. Company, Birmingham, Ala., 1-pounder, 79c.

Wm. T. Harding, Raleigh, N. C., 14-in., \$101.25; 12-in., \$67.56; 8-in., \$24.85.

Raleigh Iron Works Company, Raleigh, N. C., 8-in., \$24.85 each.

Birmingham Machine & Foundry Company, Birmingham, Ala., 14-in., \$92.50 each; 12-in., \$74.90.

The Tredegar Company, Richmond, Va., 14-in., \$88.52 each; 12-in., \$55.12; 8-in., \$24.15.

Mobile Stove & Pulley Mfg. Co., Mobile, Ala., 12-in., \$63.61 each; 8-in., \$28.52.

Edward Valve & Mfg. Co., Chicago, Ill., 1-pounder, 78c. each.

American Car & Foundry Co., New York City, 3-in., \$2 to \$3.35 each.

The Bridgeport Projectile Company, Bridgeport, Conn., 5-in., \$14.50; 4-in. (Mark VII), \$9.30; 4-in. (Mark V-1), \$9.30; 3-in., \$3.85; 1-pounder, 75c.

Linderman Steel & Machine Co., Muskegon, Mich., 5-in., \$11.58 each; 4-in. (Mark VII), \$9.89; 4-in. (Mark I), \$10.79; 3-in., \$4.52.

The Platt Iron Works Co., Dayton, Ohio, 1-pounder, 88c.

Bethlehem Steel Company, South Bethlehem, Pa., 14-in., \$108.23 each; 12-in., \$68.34; 8-in., \$25.35; 5-in., \$10.94; 4-in. (Mark VII), \$8.20; 4-in. (Mark V-1), \$8.20; 3-in., \$4.02; 1-pounder, 75c.

S. A. Woods Machine Co., Boston, Mass., 3-in., \$3.50 each.

Washington Steel & Ordnance Co., Washington, D. C., 14-in., \$85 each; 12-in., \$52.

American & British Mfg. Co., Bridgeport, Conn., 5-in., \$10.20 each; 3-in., \$4.78.

Plans for Extensive Shipbuilding

To meet the submarine menace, the United States Shipping Board has organized a \$50,000,000 corporation which, if Congress passes a bill now in course of preparation, will be expanded to a \$225,000,000 concern to build a fleet of wooden cargo ships to transport supplies to the allies. According to the plans of the board, private shipyards will construct the vessels on a standardized plan and although millions of private capital are already being offered for the building of the vessels, it is among the possibilities that the board will finance some of the yards with a view to expediting the early completion of the largest possible number of ships.

Major Gen. George W. Goethals, who made such a splendid record in digging the Panama Canal, has accepted the post of director of this work at the special request of President Wilson. He will be assisted by F. A. Eustace, the Boston mining engineer, and will have the co-operation of F. Huntington Clark, the New York engineer who first conceived the idea of a big wooden ship fleet.

While the construction of the wooden ships is in progress, it is understood that the Shipping Board will take over the 700,000 tons of German and Austrian ships recently seized by the Government and will cause them to be repaired as speedily as possible in order that they may be used as cargo carriers. There is some opposition to this employment of the interned Teutonic ships, but the Shipping Board is vigorously insisting that no better use could be made of these vessels and that the circumstances justify this plan.

The Shipping Board is also urging that all vessels now being constructed in American shipyards for foreigners be taken over by the United States and used as cargo ships or naval auxiliaries. This project has been in mind for some weeks, but the details have not yet been worked out.

Series of War Bills

The House Committee on Naval Affairs has reported to the House a series of war measures, one of which amends existing laws regarding the Government control of ships and shipbuilding facilities of the country so as to include specifically the power to take over for Government use any and all boats, lighters, tugs, etc., at proper compensation. When all the projects now on foot are carried out, the Government will be specifically authorized to use for the purpose of carrying on the war practically every vessel in the United States regardless of previous ownership.

The Senate has passed the army appropriation bill adding nearly \$40,000,000 to the total. Among the items in the ordnance department increased by the Senate over the House bill are the following: For the manufacture and purchase of small arms ammunition, from \$2,000,000 to \$2,850,000; for manufacturing, repairing and procuring arms for the national armories, from \$6,000,000 to \$7,350,000, of which \$600,000 instead of \$200,000, as provided by the House bill, may be used in procuring gages, dies, jigs, tools, etc., to fit up private plants for the production of arms made to United States army standards; ordnance stores to be purchased instead of manufactured, from \$5,000,000 to \$6,000,000; automatic machine rifles, from \$3,000,000 to \$7,350,300. There is no doubt that the House will accept the Senate amendments and it is expected that the President will sign the bill in a day or two. By special provision the appropriations carried by the army bill, aggregating \$278,000,000, will be immediately available.

Extending President's Power

With the approval of President Wilson, Chairman Adamson, of the House Committee on Interstate and

Foreign Commerce, has introduced a bill giving the President control, during the war, of all railroads, telegraph and telephone lines. This bill is somewhat similar to a measure introduced but not passed in the last Congress as a part of a comprehensive legislative program dealing with the railroad problems. The new bill would permit the use of the railroads by the Federal Government without the transfer of their management to the United States. The President is authorized to draft into the military service of the country the employees of the utilities thus commandeered and the military forces of the country would be available in the protection of the operation of the lines. Upon the resumption of peace, however, all control over the roads would immediately revert to private ownership. The bill also authorizes the increase of the Interstate Commerce Commission from 7 to 11 members and empowers the commission to fix the compensation to be received by the railroads whenever their control is taken over by the Government.

The Council of National Defense is giving serious consideration to the question of the extent to which the manufacturers of the country can reasonably be called upon to make special prices on war material to be supplied to the Allies now that the United States has joined in the war. It is not believed that an attempt will be made to force manufacturers to accept prices as low as those which producers have agreed to take for goods supplied to the United States, but compromise figures are talked of which would represent substantial cuts from current contract prices.

W. L. C.

Additional awards by the Navy Department for submarine chasers under schedule 891½, opened March 31, were made for a total of 116 boats ranging in value from \$35,000 each for six boats to \$52,000 for one boat. The largest single contracts were both for 20 boats and were given to Charles A. Bean, Alexandria, Va., for \$48,250.50 each and to the New York Yacht, Launch & Engine Company, Morris Heights, N. Y., for \$49,950 each.

A Bill for an Embargo on Exports

The Department of Justice has drafted a bill which has been introduced in the House by Representative Adamson of Georgia, chairman of the Committee on Interstate and Foreign Commerce, authorizing the President to impose embargoes on exports. The bill provides that whenever the President makes proclamation that public safety or welfare requires, it shall be unlawful to export any articles from the United States, except at times and places and under such orders, limitations and exceptions as he shall prescribe, until otherwise ordered by the President or by Congress. Any person who shall export or attempt to deliver for export any article in violation of this bill would be penalized by a maximum of \$5,000 or five years' imprisonment, or both, and the articles seized and forfeited. Officers, directors or agents of a corporation participating would be liable to the same penalties. The pacifist element in Congress is seeking to make it appear that this bill has been framed in the interest of the movement to prevent exportations of war material. The fact is, however, that its chief object is to enable the Government, in case of a serious food shortage, to come to the aid of the consumers of this country by prohibiting the exportation of food products needed by the American people.

The Car Shortage at Chicago

The shortage of freight cars shows little or no abatement in the Chicago territory. Conditions are shown by the case of a large jobbing house, which was

offered a delivery of sheets from an Eastern mill provided the use of flat cars was acceptable. The jobbing house looked up the weather records for April and decided that the inevitable result of shipping on flat cars would be rusted stock. The use of tarpaulins has been found impracticable, as they are invariably cut or torn by the shifting or rubbing of the freight. Another evidence of the shortage is that the railroads find it difficult to find cars wherewith to make shipments of old material, their own as well as that of other shippers. Incidentally the railroads are scrapping less material than usual. One explanation of the shortage of box cars is that considerable coke is being shipped in them.

Guarding Connecticut Munitions Plant

The first drastic step in the protection of New England factories has been made in Bridgeport, Conn., where what amounts to martial law is in force in the district surrounding the plants of the Remington Arms Union Metallic Cartridge Company. Several streets are closed and patrolled by soldiers, the houses in the district have been searched and arms of all kinds removed, and several families have been ejected or ordered to remove. Trolley cars on Barnum Avenue, one of the principal streets of the city, are not allowed to stop within the patrolled district and while running through it armed guards are stationed on each platform.

Governor Beeckman of Rhode Island called a conference, April 13, of the leaders of the Senate and House to consider a request of the War Department that no legislation affecting the conditions of labor be enacted by the Assembly during the war. The War Department asks that the Assembly pass a measure delegating to the Governor discretionary right to modify any existing law affecting labor or the hours or conditions of work. Another conference has been called for April 16 at which representatives of labor will be present.

Large Orders for Sheet Steel Tent Stoves

The Edwards Mfg. Company, Cincinnati, has taken a Government contract for 38,800 tent stoves. This is but the beginning of buying for this purpose, and it is probable that eventually the Government orders will exceed 300,000 stoves. For the contract named about 550 tons of sheets will be required, and orders for these have been placed with two sheet mills.

Schwab Speaks of Bethlehem's Preparedness

Charles M. Schwab, as principal speaker at the annual dinner of the Society of Alumni of Bellevue Hospital, held at the Hotel Astor, New York, April 11, repeated his offer of the "brains and the brawn" of the Bethlehem Steel Company for national defense.

One 10,000-ton ship a week is the record, according to Mr. Schwab, being accomplished by his plant toward establishing a merchant marine. He deplored the fact that only 40 per cent of the vessels now building in American shipyards were for this country. As an example of Bethlehem's preparedness to produce munitions, he related the story of Lord Kitchener's request in 1914 that Bethlehem make 1,000,000 shells for the British Government in a year. In spite of the fact, he continued, that all the munition factories of this country combined were turning out only 100,000 shells annually, Bethlehem filled the order in 10 months.

The Vulcan Steel Products Company, 120 Broadway, New York, states that it has booked orders for 175,000 gross tons of steel since Sept. 27, 1916.

Pittsburgh and Nearby Districts

At a recent meeting of the men having charge of employment in the plants of the Employers' Association of Pittsburgh, an organization was formed called the Employment Managers' Association of Pittsburgh. The following officers were elected: E. F. Harris, president; A. J. Hartman, vice-president; John C. Bowers, secretary; W. L. Hindman, treasurer. One of the provisions of the by-laws states that "no applicant for membership shall be considered unless the name of the applicant shall have been suggested to the general manager of the Employers' Association by said applicant's employer."

According to announcement made April 5 by the American Manganese Mfg. Company, about 600 former employees of the Dunbar Furnace Company, or their heirs, will receive back pay due them from the time that company, predecessor of the Manganese Company, went into receivership July 22, 1910. It is understood that between \$25,000 and \$30,000 is payable, this representing the wages of the men from July 1, 1910, to the time the company failed. Successful management of the plant and the country's prosperity have made possible the payment of the old obligations.

Monaca, Pa., will receive bids until May 1 for two motor-driven centrifugal pumps of 1,000,000 gal. per day capacity each. Michael Baker, Beaver, Pa., is borough engineer.

On April 13 the Brier Hill Steel Company successfully started its new plant of 84 Koppers by-product coke ovens at Youngstown, Ohio. The company also has 470 beehive ovens at Brier Hill, Pa., which it will continue to operate. The by-product plant in connection with the Koppers ovens will start about May 1, turning out benzol, tar, etc. The company has placed a contract for the erection of a five-story general office building to be erected on Federal Street, West Youngstown. This building will cost about \$350,000 and the general offices will then be removed from the Stambaugh Building in Youngstown. Some months ago the company took over the sheet plant of the Western Reserve Steel Company, Niles, Ohio, and it is now adding two hot mills, making a total of eight hot mills.

The 72-in. three-high plate mill in the plant of the Youngstown Iron & Steel Company, now owned by the Sharon Steel Hoop Company, Sharon, Pa., will be started about May 15, after being idle three years. It can roll plates up to 70 in. wide, and can turn out about 200 tons per day. The mill is being thoroughly overhauled.

The William B. Pollock Company, Youngstown, has received a contract for the erection of a 50-ton charcoal furnace for the State of Mysore, India, also a contract for two 500-ton blast furnaces for the Tata Iron & Steel Company, Sakchi, Bombay, India. Included in the latter contract are 12 Berg cinder cars and 12 Pollock short-pour metal cars. The material for all these furnaces will be built in the Pollock shops, then crated and shipped to India, the work of erection to be done by the Indian companies.

The Westinghouse Electric & Mfg. Company, East Pittsburgh, is sending out a supplemental list asking for prices on bending, punching, and shearing machinery for its new plant at Essington, Pa. Contracts totaling about \$2,000,000 have been placed recently with the company by the New York Shipbuilding Company, for furnishing the necessary electrical equipments for the propulsion, lighting and general power requirements of the new superdreadnaughts Colorado and Washington.

The Pittsburgh Steel Products Company, a subsidiary of the Pittsburgh Steel Company, is in the market for two 10-ton and five 5-ton electric cranes.

At the monthly meeting of the Pittsburgh Foundrymen's Association, held in the Fort Pitt Hotel, Pittsburgh, on Monday evening, April 16, standard methods of figuring costs were considered. The work undertaken by the American Foundrymen's Association to standardize methods of figuring costs were presented in detail by C. E. Knaeppel, who explained methods of accounting recommended by the cost committee of that association.

Machinery Markets and News of the Works

WAR BUYING NOT HEAVY

Steady Domestic Trade a Marked Feature

Government Demand Is for Cranes—Manufacturers Prepare for Army and Navy Needs—Woodworking Tools Selling Well

Government demand for machine tools has not as yet proved a very important factor in the market. At most it has served only to stiffen conditions a bit. In some sections no effect at all is felt. The emphasis of Government buying has been almost entirely upon cranes, both overhead traveling and locomotive. Several hundred of the latter will probably be needed in the next few months for expediting war work. Twenty have recently been purchased for the navy yards. A large number of overhead electric traveling cranes are required for the Philadelphia Navy Yard, in addition to a 350-ton unit, said to be the largest in the world. The expected taking-over of machine-tool plants by the federal authorities has not yet materialized, but many manufacturers are preparing their plants to handle Government work which they anticipate receiving shortly.

Domestic machinery business, while not showing much impetus from the initiation of war moves, maintains the steady run of orders for small numbers of tools of all kinds from all classes of buyers. Each day that passes further confirms the almost complete discounting of the holding-up of requirements on account of any war scare.

Second-hand equipment has rapidly disappeared as a market factor of major importance.

Throughout the Central West industry is working under such a heavy pressure that the shortage of skilled labor is again evident.

Wood-working machinery is everywhere in strong demand. Undoubtedly the forced production of wooden ships has had a lot to do with this development, and will likely be more apparent before long.

While export trade is being booked right along, this branch of the market is without emphasis from any quarter right at this time.

Neutral Countries Accumulating Machine Tools

An interesting development in the machine tool trade of the Central West relates to the export trade with neutral countries in Europe. Quite a large number of machine tools were ordered by agents in Holland, Denmark and Sweden some time ago, and in a few instances the American manufacturers have offered to pay the agents' commissions and cancel these orders so that they could divert the machines to domestic customers. Almost invariably the European agent has forwarded the full price of the machines with the request that they be stored for his account until such time as shipments can be made to Europe. Some of these same agents have placed additional orders for machine tools, since advanc-

ing manufacturing costs have forced prices up to the present level, knowing that it will be difficult if not impossible to get shipments through before the end of the war.

Speculation is natural as to the reason machine tool importers in Europe are planning so far ahead. There is evidently a belief that the reconstruction period there will be one of feverish activity.

New York

NEW YORK, N. Y., April 18, 1917.

The machine-tool business continues to maintain the high level of inquiry and orders which has characterized it for the past six weeks. A slight acceleration in inquiry has resulted from war preparations; but while representatives are giving their first attention to navy-yard and other Government needs, the total of such business is not yet great enough to do more than stiffen the market. Inquiry is from all sources and for all lines of tools. No emphasis is placed on export business anywhere. Those plants which are under imperative orders from Washington have already closed on requirements which have been before the trade only a few days. Among such buyers are the Marconi Wireless Telegraph Company of America, Roselle, N. J., which has purchased 12 turret lathes and some drill presses and the Standard Aeroplane Corporation, Plainfield, N. J., which has bought for its new shop addition. The aeroplane plants in general are actively in the market. The General Electric Company is reported to have recently taken over from another company an incompleting shell order. It is still in the market where for weeks it has been one of the largest and most persistent purchasers. Its most recent purchases, which are for its plant at Erie, Pa., included one lot of 8 turret lathes. Factories producing munitions and accessory equipment have put out specifications for tools which will be needed when Government contracts are concluded, but it is stated that final arrangements have in some cases been held up for several days. Government control of plants will probably be more strongly evident in the near future. One Middle West manufacturer has been notified to inventory both his orders and unfinished machines and to hold all completed units at the disposal of the Government, subject to its instructions. Some shipments are permitted to go forth from the plant in question, but so far in only a limited degree. Another machine-tool dealer in this city has been advised that his company will be requisitioned, although just what this means has not yet developed.

In its appropriations of millions of dollars for the navy yards it is evident that the Government will devote large sums to the purchase of hoisting and conveying equipment. It has now under consideration the installation of a large number of cranes at the League Island Navy Yard, including a 350-ton crane, which will be the largest in the world. In the next few months it is likely that it will require several hundred locomotive cranes. Twenty of these were recently purchased for the navy yards. The Crucible Steel Company of America, Pittsburgh, Pa., will shortly close for seven cranes of 50, 25, 10 and 5-ton capacities for its Atha plant at Harrison, N. J. The Davison Chemical Company, Baltimore, Md., has put out a bond issue of \$2,500,000 for a development of its pyrites deposits on the coast of Cuba and is seeking a special crane to be equipped with an 18-ton bucket for loading vessels estimated to cost about \$175,000.

The pressure of buying from the shipyards was not particularly in evidence the past week, although some is being done. New projects in this line are brought forth almost daily, and doubtless will materialize before long.

Following the breaking off of relations with Germany a slight falling off in purchases of locomotive cranes, quarrying machinery and similar lines in the East has been noticeable. It is now picking up rapidly. At the same time no such drop in these lines occurred in the Central West, but rather a steady speeding-up of demand from all kinds of manufacturing plants.

The Texas Company, 17 Battery Place, New York, has purchased about \$25,000 worth of rolls, punches, shears, etc., for its oil-tank shop at Port Arthur, Tex.

The chief of the Bureau of Yards and Docks, Navy Department, Washington, is having plans drawn for a one and two-story shop building for the Brooklyn Navy Yard, 300 x 600 ft., estimated to cost \$1,000,000.

The Engel Machine Tool Company, Syracuse, N. Y., has had plans drawn for a one and two-story factory, 100 x 440 ft. The Ferro Concrete Construction Company, Cincinnati, Ohio, is the builder.

The Gleason Works, Rochester, N. Y., is taking bids through its architect, John Vickery, Rochester, for a one and two-story factory building, 100 x 360 ft.

J. H. Williams & Co., Vulcan Street and Kenmore Avenue, Buffalo, N. Y., have awarded contract to the John W. Ferguson Company, Paterson, N. J., for one and two-story factory buildings, 20 x 83 ft., 63 x 80 ft., and 20 x 98 ft.

The Forging Company, Union, N. Y., has awarded contract for a one-story forge shop, 100 x 105 ft., to cost about \$20,000.

The Continental Heater Corporation, Dunkirk, N. Y., has constructed a one-story addition to its foundry, 48 x 112 ft. M. C. Reed is manager. Equipment has been ordered.

The Interocean Oil Company, 90 West Street, New York, is planning the erection of a high-grade oil plant at East Brooklyn, near Baltimore, Md. It is said that the company has authorized an appropriation of \$2,000,000 for the erection of the plant, which will be near the works of the United States Asphalt Refining Company, a subsidiary.

The Upson Company, maker of fibre board, Lockport, N. Y., has increased its capital stock from \$100,000 to \$1,000,000 to provide funds for purchasing machinery and enlarging its facilities. Uncertain and distant deliveries on equipment have caused the company to give up the idea of expansion for the present. Charles A. Upson is president.

The West Pulverizing Machine Company, 220 Broadway, New York, with a plant at Newark, N. J., has acquired about three acres on Evergreen Avenue, Newark, for a new plant. The company specializes in the manufacture of cement-mill machinery, in connection with its general machine and foundry business. A. Lincoln West is president.

The Higrade Belting & Weaving Company, Newark, N. J., has awarded a contract for the erection of its new belting plant at 60-76 Frankfort Street, one story, 100 x 200 ft., with engine house and boiler plant, 35 x 50 ft., estimated to cost \$25,000. A. G. Fenwick is president and F. F. Fenwick is treasurer. It has established temporary headquarters at 671 Broad Street.

The United Metal Ceiling Company, 498 South Twenty-first Street, Irvington, N. J., has been organized to operate a local plant. Harry Daniel, 187 Broad Street, is promoting it.

The Newark Wire Cloth Company, 222 Verona Avenue, Newark, N. J., has filed plans for a one-story brick addition, 40 x 100 ft. The company has recently acquired property on Mt. Prospect Avenue for a new plant to cost about \$50,000. John A. Campbell is president.

The board of education of the Essex County Vocational Schools, 316 Essex Building, Newark, N. J., will receive bids until 4:30 p. m., April 26, for three engine lathes, one planer, one automatic screw machine and one power hack saw, electrical equipment, meters and instruments, a motor generator set, slate switchboard, storage battery, small tools, supplies for an electrical machine and carpenter shops. Wesley A. O'Leary is director.

The Eisenruth Compound Motor Company of New York has been incorporated in Delaware with a capital of \$30,000,000 to manufacture locomotives, cars and boilers. Samuel B. Howard, 28 Nassau Street, New York; Arthur W. Britton and Harry W. Davis, all of New York, are the incorporators.

The Downey Shipbuilding Corporation, New York, has been incorporated in Delaware with a capital of \$5,000,000 to operate a shipbuilding plant for the construction of freighters, at Milliken, Staten Island. Wallace Downey, 120 Broadway, president of the company, has recently acquired the plant of Milliken Brothers, Inc., at this location, to be used in connection with the shipyards. It is proposed to establish six shipbuilding slips as the initial plant.

The Nichols Copper Company, Hobson Avenue, Laurel Hill, Long Island, N. Y., has acquired 36 building lots in the Newtown section for extensions.

The Pratt & Cady Company, 259 Canal Street, New York, manufacturer of valves and steam specialties, has increased its capital from \$600,000 to \$1,000,000.

Fire April 10 destroyed the plant of the Eagle Wrapping Corporation, Ballston Spa, N. Y., manufacturer of box-board specialties, with a reported loss of \$75,000.

J. O. Mahony, 49 Lexington Avenue, Bayonne, N. J., manufacturer of wagons, has filed plans for the erection of a one-story plant at 70-78 Boulevard to cost about \$7,000.

The Electric Dynamic Company, Avenue A, Bayonne, N. J., manufacturer of dynamos and motors, will build a three-story addition at Avenue A and North Street to cost \$15,000. The company is a subsidiary of the Electric Launch Company, manufacturer of submarine boats.

The Hudson Metal Mfg. Company, 141 Railroad Avenue, Jersey City, N. J., has been incorporated with a capital of \$25,000 to manufacture tools and metal specialties. Samuel Schnabolk, 258 Barrow Street, and Axel Salstrom, 298 Barrow Street, are the principal incorporators.

The New Jersey Engineering & Supply Company, 177 Main Avenue, Passaic, N. J., has filed plans for the erection of an addition on Exchange Place to cost about \$44,000.

The Public Service Electric Company, New Brunswick, N. J., has filed plans for an engine and compressor plant.

The International Elevating Company, 5 Morris Street, Jersey City, N. J., will build a two-story shop addition to cost about \$9,000.

The Wadell-Bowen Company, Newark, N. J., has been incorporated with a capital of \$125,000, to manufacture machinery and tools. G. F. Bowen, Newark; N. V. and James V. Wordley, East Orange, are the incorporators.

The Chemical Company of America, Springfield, N. J., is planning for the erection of additions to its plant near Westfield Avenue. The works now consist of 26 buildings. Dr. Samuel Isermann is president.

The Ford Motor Company, 1723 Broadway, New York, has perfected plans for its proposed automobile plant on property recently purchased in the meadow section, Kearny, N. J., fronting on the Passaic River. It is said that the plans provide for the erection of five four-story buildings to form the initial plant, each structure to be about 325 x 1400 ft. Work has commenced on the construction of a bulkhead 1000 ft. long. A seven-track terminal will be established at the site by the Central Railroad of New Jersey. The entire project is estimated to cost in excess of \$1,000,000.

The City Council, Elizabeth, N. J., is arranging for an appropriation for the preparation of preliminary plans, surveys and other work in connection with its proposed municipal electric lighting plant.

The Rockwood Mfg. Company, Rockwood, N. Y., is having plans prepared for a hydroelectric power plant to cost approximately \$300,000. Donald W. Hyde, Gloversville, N. Y., is president.

The Bridgeford Machine & Tool Corporation, Rochester, N. Y., has completed plans for a factory, 100 x 400 ft., one story, which it will erect at once.

Plans have been drawn for an addition 40 x 80 ft., to the machine shop of Maxwell Karge, Jefferson Street, Phoenix, N. Y.

New England

Boston, Mass., April 16, 1917.

The Amston Motor Car Company, Hebron, Conn., has been incorporated with a capital stock of \$3,000,000 by Conrad D. Trubenbach, James T. Connor and L. R. Watkyns, all of Bridgeport.

The Franklin Machine & Tool Company, Springfield, Mass., has been incorporated with a capital of \$50,000. Robert A. Johnson is president; Carl R. Molin, 47 Meford Street, Springfield, treasurer; and O. S. Johnson, a director.

The Portsmouth Foundry Company, Portsmouth, N. H., is to build an addition to its plant in the rear of Hill Street.

The Universal Snap Fastener Company, Boston, Mass., has been incorporated with a capital of \$50,000. The directors are Harry Blumenthal, president; Abraham Blumenthal, 8 Beacon Street, treasurer; and T. McDonough.

A factory for the manufacture of aeroplanes for the Italian Government is under construction at the shipyards of Capt. Philip H. Doyen, Cottage Street, South Portland, Me.

The Eastern Bolt & Nut Company, East Providence, R. I., has awarded a contract for an addition, 50 x 196 ft.

The B. C. Company, Revere, Mass., has been incorporated with a capital stock of \$5,000 to operate a brass, aluminum and iron foundry. The directors are H. A. Buzzell, president; Edward H. Tibbetts, Revere, treasurer; and P. A. Buzzell.

The Atlantic Motor Works, Inc., Stamford, Conn., has been incorporated with a capital of \$10,000. William B. Tate, president; John B. Hilton, New York, vice-president; James D. Lecky, Greenwich, secretary, and Karl LaRoche, treasurer, are the incorporators.

The Waterbury Clock Company, Waterbury, Conn., has awarded a contract for an addition, 73 x 114 ft., seven stories, at Cherry Avenue and Maple Street.

The Steel Products Company, Hartford, Conn., has been

incorporated with a capital of \$1,500,000. It will commence business with a capital of \$100,000. The incorporators are Harry W. Williams, Joseph W. Connor and Raymond B. Berry, all of Hartford.

The Waterbury Rolling Mills Company, Waterbury, Conn., has awarded a contract for an addition, 64 x 150 ft., with ell, 23 x 66 ft., one story, to its plant on East Aurora Street.

The H. & H. Foundry Company, Stamford, Conn., will build an addition to its foundry.

The Capital Wind Shield Device Company, Hartford, Conn., has been incorporated with a capital of \$24,000 by John J. Campbell, Naiman Goldberg and John J. Ahern, all of Hartford. It will begin business with a capital of \$15,000.

Thomas J. Finn, Waterbury, Conn., has purchased a tract of land in Worcester, Mass., adjoining the tracks of the Boston & Maine Railroad, and is having plans drawn for an iron foundry to cost about \$50,000. Mr. Finn and his associates will probably form a Massachusetts corporation. Construction will begin as soon as possible.

Philadelphia

PHILADELPHIA, Pa., April 16, 1917.

The Navy Department has received bids for the erection of a new machine shop, 130 x 675 ft., and a four-story electrical shop, 130 x 335 ft., at the League Island Navy Yard, Philadelphia. The F. W. Mark Construction Company, Finance Building, Philadelphia, is low bidder for the construction at \$610,000 and \$300,000, respectively.

The H. T. Shearer Machine Company, Waynesboro, Pa., recently incorporated with a capital stock of \$30,000, has elected the following directors: H. T. Shearer, the promoter, for a number of years assistant superintendent of the Landis Tool Company, Waynesboro; G. T. Shearer, also with that company, and for nine years its representative in Berlin, and W. H. Strauss, general manager of the Waynesboro Foundry & Machine Company. The officers are H. T. Shearer, president and general manager; G. T. Shearer, vice-president, and W. H. Strauss, secretary and treasurer. The purpose of the company will be to do a general line of machine work. It will make a specialty of jigs, tool equipment, etc. In the near future, however, it will manufacture precision surface-grinding machinery as a regular product. Also, in connection with the tool work, it will build aeroplane motors. The plant will be located in Waynesboro, and not Lancaster, as has been stated. The building will be one story, 42 x 150 ft., of brick, concrete and steel, with a temporary end for extension. The equipment will be of the most modern and up-to-date type and all of it entirely new. The plant is in process of construction and the company expects to have the machinery installed and in operation by June 15.

The proposed plant of the American Metal Works, Armat and Heiskel streets, Germantown, Philadelphia, to be erected on Stenton Avenue, will be used for the manufacture of stamped metal goods and metal electrical specialties. It will consist of two buildings, a main factory, two stories, of reinforced concrete, 60 x 320 ft., and an adjoining two-story structure, 40 x 115 ft. It is said that employment will be given to about 250 hands. The plant, which is estimated to cost \$125,000, will be placed in operation about Sept. 1, when it is proposed to remove the present factory to the new location. Frederick Schwab is president.

The Weimar Chain & Iron Company, Lebanon, Pa., has awarded the contract for the enlargement to double its plant. The heaviest chain the company has made has been 2½ in., but it will hereafter make 2¾ chain. It is expected to have the new plant completed in a short time. A large testing machine with a maximum capacity of 1,000,000 lb. will be installed.

The McCausland Engineering Company, Pennsylvania Building, Philadelphia, recently organized to manufacture motors and similar equipment, has acquired property at Fifth and Penn streets, Chester, including a factory building formerly occupied by the Patterson Mills. Three new two and three-story buildings will be erected to form the initial plant, 75 x 320 ft., 60 x 80 ft., and 33 x 46 ft., respectively.

The Hall Gas Engine Company, 4821 Garden Street, Philadelphia, manufacturer of gas and gasoline engines, will build a one-story machine shop, 30 x 100 ft.

Thomas Saville Sons, 1310 Wallace Street, Philadelphia, manufacturers of brass goods for steam fitting, etc., have acquired property at 635-9 Watts Street for an addition.

L. M. Shoemaker, Inc., Philadelphia, has filed articles of incorporation at Harrisburg with capital stock of \$400,000, to manufacture mechanical oils, greases, etc. William Adamson is treasurer.

The Electric Service Supplies Company, Seventeenth and Cambria streets, Philadelphia, manufacturer of electrical specialties, has awarded a contract for a three-story brick

addition, 45 x 60 ft., to cost \$60,000. John N. Gill & Co., Otis Building, are the contractors.

The Gill Glass Company, Philadelphia, has awarded contract for a new plant at Tloga, Venango and Amber streets to cost \$250,000. The works will consist of five buildings, with a main one and three-story structure, 175 x 330 ft. William R. Dougherty, Philadelphia, is the contractor.

The Westmoreland Chemical Company, Twenty-second and Westmoreland streets, Philadelphia, has filed plans for improvements to its oven plant to cost \$16,000.

The Niles-Bement-Pond Company, Meadow and Mifflin streets, Philadelphia, is taking bids for a one-story addition to its plant.

Fire April 10 destroyed part of the plant of the Delton Tire & Rubber Company, Trenton, N. J., with loss estimated at \$125,000.

The John E. Thropp's Sons Company, Trenton, N. J., manufacturer of machinery, tire-making moulds, etc., has awarded a contract for a two-story addition, 40 x 60 ft., at Lewis Street and Greenwood Avenue, to cost \$22,000.

The New Jersey Chemical Company, 145 North Willow Street, Trenton, N. J., recently incorporated with a capital of \$25,000, is planning the establishment of a local plant for the manufacture of a special chemical. David Berkow is president.

The Automatic Air & Steam Line Connection Company, Trenton, N. J., has been incorporated with a capital of \$100,000. Harry H. Umberger, Trenton; John S. Tripp and Adam Reemer, Oklahoma City, Okla., are the incorporators.

The Pottstown Steel Plate Products Company, Pottstown, Pa., recently organized with a capital of \$50,000, is reported to have acquired about four acres near the local lines of the Philadelphia & Reading and Pennsylvania Railroads for its proposed plant.

The City Council, Quakertown, Pa., is planning for extensions and improvements in the municipal electric light plant to cost about \$45,000.

Fire April 10 at the coal plant of the Philadelphia & Reading Coal & Iron Company, at Abrams, near Norristown, Pa., destroyed conveying and loading and other equipment, with a reported loss of about \$75,000. Oscar Blew is superintendent.

The Borough Council, West Chester, Pa., will receive bids until 8 p. m., April 25, for a new sewerage pumping station and complete mechanical equipment. Remington & Vosbury, 601 Market Street, Camden, N. J., are the consulting engineers. W. S. Underwood is borough clerk.

The Hess-Bright Mfg. Company, Front and Erie streets, Philadelphia, has started the construction of a factory building, 82 x 220 ft., estimated to cost \$5,000. The G. C. Rea Company, 1023 Wood Street, Philadelphia, is the contractor.

The plant of Ness Brothers & Co., Broad and Philadelphia streets, York, Pa., manufacturers of wagons and wagon parts, was partially destroyed by fire April 10 with a reported loss of \$25,000.

In connection with the survey of the traction system of the Harrisburg Railways Company, Harrisburg, Pa., now being made by Bion J. Arnold, Chicago, Ill., improvements and extensions are reported under consideration in its car shops, car barns and power plant.

The Mine Car Supply Company, Scranton, Pa., has had plans drawn for a two-story plant addition, 48 x 80 ft., to cost about \$10,000. Duckworth Brothers, Coal Exchange Building, Scranton, architects, are taking bids for its construction.

Sprague & Henwood, Scranton, Pa., will take bids about May 15 through their architect, Edwin Langley, Scranton, for a one-story machine shop, 65 x 185 ft.

The Yorkhaven Paper Company, Yorkhaven, Pa., is about to receive bids for a one-story machine shop and stockroom, 30 x 100 ft., to cost about \$15,000.

Baltimore

BALTIMORE, MD., April 16, 1917.

The chief of the Bureau of Yards and Docks, Navy Department, Washington, is reported about to take bids for the building of an erecting shop and hangars in Florida to cost about \$240,000. The bureau has rejected bids for constructing a shipbuilding slip for the Norfolk Navy Yard. Bids for hydraulic motor-driven pumps and accumulators for this yard and that at Philadelphia will be received until 11 a. m., April 23.

The Baltimore Tube Company, Wicomico and Ostend Streets, Baltimore, will build a one-story machine shop, 62 x 141 ft., at a cost of about \$10,000. The contract has

been awarded the West Construction Company, American Building, Baltimore.

Henry A. Kries & Sons, Union Trust Building, Baltimore, have leased property at 6-8 West Lombard Street for a machine shop and supply house.

The Kelly-Springfield Tire Company, Akron, Ohio, has started the construction of a plant at Cumberland, Md., to cost about \$4,500,000. The Diescher Engineering Company, Pittsburgh, Pa., is the contractor.

The Hess Steel Corporation, Loney's Lane and Pennsylvania Railroad, Baltimore, has commissioned Blanke & Zink, architects, to prepare plans for a 53 x 50-ft. steel furnace. Builders have been invited to bid on the work.

The Stanley Motor Carriage Company, Wilmington, Del., has been incorporated with a capital stock of \$13,100,000, to manufacture automobiles. E. Latter, C. L. Rimlinger and C. M. Egner, Wilmington, are the local incorporators.

The Bowen Anchor Company, Wilmington, Del., has been incorporated with a capital of \$50,000 to manufacture anchors for ships and boats. W. F. Smalley, John P. Cann and A. M. Walker, Wilmington, are the incorporators.

The Dunwoody Automatic Gun & Projectile Company, Washington, D. C., has been incorporated in Delaware with capital of \$100,000 to manufacture firearms and ammunition. H. H. C. Dunwoody, R. S. Knapp and H. E. Gasch, all of Washington, are the incorporators.

The Scott Gas Appliance Company, Washington, D. C., has been incorporated with Delaware charter and capital of \$150,000 to manufacture gas appliances. Frank G. and J. G. Scott and George C. Shaffer, Washington, are the incorporators.

Chicago

CHICAGO, ILL., April 16, 1917.

The Illinois Wire & Cable Company, Sycamore, Ill., has had plans drawn by its architect, A. P. Weber, 10 South La Salle Street, Chicago, for a two-story and basement factory building, 90 x 160 ft., estimated to cost \$40,000.

The Edward Valve & Mfg. Company, 72 West Adams Street, Chicago, is having plans drawn for a one-story foundry to be erected at East Chicago, Ind., 80 x 140 ft., at a cost of about \$15,000. O. E. Oleson is president. It will be of brick and stone. W. F. Branitsky, 54 West Randolph Street, Chicago, is the architect, who will receive bids.

The Smith-Form-a-Truck Company, Chicago, has let contracts to the E. L. Archibald Company, 111 West Washington Street, Chicago, for the erection of a one and two-story factory addition, 160 x 260 ft., at Sixty-sixth Street and Fifty-eighth Avenue, at an estimated cost of \$90,000. S. N. Crowen, 30 North La Salle Street, Chicago, is the architect.

The Campbell Transmission Company, 133 West Washington Street, Chicago, has awarded contracts for the erection of several manufacturing buildings for its plant at Buchanan, Mich. They will be one story and cost about \$45,000.

Joseph Benson, 1711 East Seventy-second Street, Chicago, has awarded contract for a one-story foundry to be erected at 8123 Harper Street, Chicago, 27 x 45 ft., at a cost of \$3,800. J. N. Coleman, 7100 South Chicago Avenue, is the architect.

The Bates Valve Bag Company, 332 South Michigan Boulevard, Chicago, has awarded contracts for remodeling its machine shop at Hyde Park at an estimated cost of \$15,000.

The Acme Boiler & Tank Company, 4738 Wentworth Street, Chicago, has awarded contract for the construction of a one-story boiler and tank shop at 1017 West Seventy-eighth Street, 50 x 80 ft., to cost about \$6,000.

Quincy, Ill., will receive bids until 11 a. m., May 1, for a drainage pumping plant estimated to cost \$80,000, to be equipped with 54-in. and 36-in. centrifugal pumps. W. P. Bushnell is engineer.

The Electric Coal Mining & Machinery Company, Chicago, has been incorporated in Delaware with a capital of \$150,000 to manufacture coal mining machinery. Ralph E. Battan, Arthur A. Bettridge and Seward N. Mighell, Chicago, are the incorporators.

The Kansas City Refrigerator Company, Kansas City, Mo., has been incorporated in Delaware with capital of \$350,000 to manufacture refrigerators and refrigerating apparatus. Joseph A. and Alfred S. Fullerton and Fred W. Howden, all of Kansas City, are the incorporators.

The Wahl Adding Machine Company, Chicago, has let the contract for a two-story brick addition to its plant at 1800-16 Roscoe Street to cost \$60,000. V. Hellstrom is the architect.

The Maxfer Truck & Tractor Company has purchased a two-story brick factory at the northeast corner of 147th Street and Page Avenue, Chicago.

The A. F. Anderson Iron Works, Chicago, has been incorporated with a capital of \$25,000 by Adolf F. Anderson and Bernard N. Anderson, 7947 Laflin Street.

The Pyott Company, manufacturer of cast-iron pulleys, has purchased the plant of the W. A. Jones Foundry & Machine Company at the southwest corner of North Avenue and Noble Street. The property is 240 x 582 x 530 ft., and contains a powerhouse, machine shop, foundry building and several smaller structures. It is believed that the Pyott Company will erect several new buildings.

The Ideal Steel Burial Vault Company has purchased from the Emerson-Brantingham Company property at Chicago Heights comprising 4½ acres of land and two large buildings, which it will use for the manufacture of steel burial vaults.

The name of the Southern Illinois Machine & Foundry Company, Murphysboro, Ill., has been changed to The Egyptian Iron Works and the company is considering enlarging the plant now in operation.

The Freeport Machine Works, Freeport, Ill., has plans for the erection of a new plant, to be located at 50 Galena Street.

The Indiana Rolling Mill Company and the Indiana Shovel Company, Newcastle, Ind., whose plants were recently destroyed in the tornado which swept that city, have let the contract for a new all-steel building, to be erected at once.

Fire destroyed the metal department of the Central Mfg. Company's plant at Connersville, Ind., with a loss estimated at \$150,000.

E. Norman Brydges, architect, 64 East VanBuren Street, Chicago, has received bids on a two-story factory of reinforced concrete, 100 x 110 ft., to be erected at Thirty-fifth Street and Stewart Avenue at an estimated cost of \$20,000.

The Freeport Machine Works, Freeport, Ill., is preparing plans for a new machine shop, 40 x 120 ft.

Cleveland

CLEVELAND, OHIO, April 16, 1917.

One lot of machines for quick delivery has been placed in the local market by a manufacturer having a Government order, but with this exception the demand from the Government has not affected this section. The war declaration has neither stimulated the market nor caused a hesitation in buying. While no large inquiries have been received the past week, a steady demand is coming from about all metal-working lines for one, two or three machines. The most active call seems to be for manufacturing and tool-room lathes, grinding, boring, planing and high-speed drilling machines. The demand from the rubber industry at Akron is very active, particularly for boring mills. Wood-working machinery is moving in good volume. The call for locomotive and traveling cranes is quite heavy. Large and small sized motors are very active.

The Elyria Iron & Steel Company, Cleveland, has an inquiry out for a number of second-hand tools, including boring, shaping, planing, and vertical drilling machines.

The Republic Stamping & Enameling Company, Canton, Ohio, has awarded a contract to Melbourne Brothers, Canton, for the erection of a new unit of brick, steel and concrete, to cover between 6 and 7 acres. It will include a power plant, furnace, stamping, dipping, burning, packing and wrapping buildings.

The Akron Gear & Engineering Company, Akron, Ohio, is enlarging its plant, and is in the market for some equipment.

The Hoover Suction Sweeper Company, New Berlin, Ohio, has commenced the erection of two additions to its foundry, 140 ft. and 150 ft. long, respectively, which will triple its former capacity.

The Chalmers Mfg. Company, Lima, Ohio, recently incorporated with a capital stock of \$60,000, will operate a gray-iron foundry and machine shop, and will occupy a building formerly used by the Power Mfg. Company. An additional building, 40 x 120 ft., will be erected by the Lima Chamber of Commerce. Chalmers S. Brown is president, and Frederick Biszants, secretary and treasurer.

An official of the Ohio Steel Foundry Company, Lima, denies the report that his company has purchased the plant of the Blackwood Steel Foundry Company, Springfield, Ohio. It is stated, however, that the Lima company is negotiating for the purchase of the Springfield plant.

Sealed proposals will be received by the secretary of the Board of Control, Mansfield, Ohio, April 24, for 8 reciprocal pumps, 2 centrifugal booster pumps, and 1 air compressor, all electrically driven, for the municipal waterworks.

The M. Cohen & Son Company, Cleveland, scrap dealer, has acquired a 6½-acre site at St. Clair Avenue and the Nickel Plate Railroad, where it will erect an up-to-date scrap-handling plant. It has placed orders for a locomotive

crane and five shears, and expects later to need additional equipment.

Detroit

DETROIT, MICH., April 16, 1917.

Although business here as a whole remains very good, the machine-tool market shows a slight element of quietness, it being evident that manufacturers are holding back orders until they know just what effect the war will have upon their business. Dealers report miscellaneous business good, and that large motor-truck companies are inquiring for special machines. General manufacturing conditions remain about the same as they were before the nation became engaged in war. Manufacturers have orders ahead which will keep them busy for a considerable length of time. Construction work is opening up rapidly, and the lack of skilled mechanics and laborers is the only handicap.

The Motors Metal Mfg. Company, formerly the Holihan Mfg. Company, has moved into its new plant at Milford Avenue and the Pere Marquette Railroad, Detroit. The main building is 80 x 400 ft., with buildings for shipping and receiving running at right angles to the main building. The company has purchased its own sidetracks, the entire length of the site. The officers are C. R. Talbot, president; H. A. Burnett, vice-president; William Christian, secretary, treasurer and general manager.

W. J. Parker, Corunna, Mich., has sold to the Big-gam Trailer Corporation, Detroit, manufacturer of automobile trailers, the two factories at Corunna, formerly occupied by the defunct Fox & Mason Furniture Company. The factories, although they have been idle about four years, are fully equipped, and the Detroit company will operate them.

The Arnold Ideal Farm Tractor Company, Detroit, has opened an office in Port Huron, Mich., with a view to establishing a plant for the manufacture of its tractors. Edwin Sutherland and Charles L. Parker are in charge of the company's affairs.

The Chelsea Steel Ball Company is a new industry to be established in Chelsea, Mich., a company having been formed with an authorized capital of \$75,000. The incorporators are Timothy F. Callahan, Conrad Lehman, M. J. Dunkel, John Kalmbach and L. T. Freeman. Mr. Callahan will be general manager.

The Erd Motor Company, Saginaw, Mich., has signed a contract with a Toronto, Ont., company for the production of \$250,000 worth of engines for tractors. The motors are to be delivered within the next three months, and this order will probably be followed by others. New business estimated to total up to about \$500,000, will necessitate the construction of an addition to the company's plant. Plans are now being made.

The Mott Wheel Works, Utica, N. Y., will be moved to Jackson, Mich., as the result of a campaign carried on by the Jackson Chamber of Commerce. In order to secure this new industry for Jackson it was necessary to subscribe for \$80,000 worth of stock locally.

The Wolverine Car & Tractor Company has acquired an acre of land in Inkster, Mich., and has taken an option on eight acres more. It is expected the company will build a plant on the site within the next year. It already has erected a temporary building into which it is moving its machinery, planning to begin operations there shortly.

It is reported that the Ford Motor Company, Detroit, is 110,000 cars behind orders. Due to its inability to produce cars in sufficient quantities to meet the demands, the producing of motor trucks is said to have been set aside temporarily.

Fire originating in the annealing room of the Buhl Stamping Company, Detroit, recently caused a loss estimated at \$10,000.

The Olympian Motors Company is removing from its temporary quarters in the old Flanders Mfg. Company to the more commodious Cartecar factory in Pontiac, Mich. Construction work will be begun soon on additional buildings adjoining.

The Weis Mfg. Company, Seventh and Union streets, Monroe, Mich., is preparing to commence work on a new four-story addition to its plant to be completed by Sept. 1.

The Parsons Mfg. Company, Detroit, manufacturer of automobile hardware, has awarded the contract for a new factory building at Springwells, a suburb of Detroit. It will be 60 x 450 ft., one story. Charles T. Knisely, Chicago, is president.

The Houser-Owen-Ames Company, Grand Rapids, Mich., has started work on its contract to erect a \$20,000 addition to the Clipper Belt Lacing Company's plant for the automatic machine department, 65 x 100 ft., which will double the capacity.

E. H. Foote, secretary and treasurer of the Grand Rapids

Chair Company; F. Stuart Foote, secretary and treasurer of the Imperial Furniture Company, and associates, all of Grand Rapids, Mich., contemplate the organization of a new company, which will manufacture chairs for these two companies. A plant will be erected at a cost of \$250,000.

The Loudon Mfg. Company, Grand Rapids, Mich., has filed articles of incorporation with a capitalization of \$20,000 to manufacture display cases and fixtures. The stockholders are William F., Theodore J., Albert W., Paul J., Edward A., Louis F. and Adolph J. Hake, and Helen H. Jackboice.

The Wilson Body Company, Detroit, has purchased 40 acres of land at Bay City, Mich., and has made an agreement with the Board of Commerce whereby the city will provide a fund of \$250,000 for the construction of buildings for the company. The property is located on the Pere Marquette and the Michigan Central belt lines, and will be devoted entirely to the construction of a plant for the manufacture of automobile bodies.

Giern & Anholtt, manufacturers of gages, dies, jigs, etc., 33 St. Aubin Avenue, Detroit, will break ground at once for a two-story concrete and steel factory building, 50 x 100 ft., making the third expansion it has undertaken since it started business April 1 four years ago.

The D'Arcy Spring Company, Kalamazoo, Mich., will enlarge its factory at an estimated expenditure of \$100,000. The factory force will also be greatly increased.

Milwaukee

MILWAUKEE, WIS., April 16, 1917.

Numerous requests for quotations have been received by machine-tool builders in this district the last 10 days from private corporations said to be equipping for federal use and occupancy. Local manufacturers are besieged with a large volume of orders, principally from domestic sources, calling for standard machines. At present shops are quoting from 9 to 10 months' delivery, which will doubtless be further extended. Orders consist mainly of small lots and single tools, although a lot of about 30 milling machines was placed by a Middle Western automobile interest which is producing gas engines for aircraft. The demand is so general that it is impossible to point to any one industry as being the predominating buying element. The freight situation has improved, but the new demand is so wide and urgent that shops are constantly finding the pressure becoming greater and hope of relief more remote.

The Ajax Frog & Switch Company, Blue Island, Ill., has started excavations for its new plant at Superior, Wis., to cost about \$60,000. The main building will be 200 x 240 ft., one story, of brick, steel and concrete. It is to be completed by Aug. 15.

The Bruley Wrecking Tool Company, Green Bay, Wis., has been organized with a capital stock of \$5,000 by Emery Bruley, Lynn D. Joseph and M. L. Evans.

The Dane Mfg. Company, Dane, Wis., has been incorporated with a capital of \$15,000 by August J. Dohm, Ben A. Meek and Robert O. Dohm to manufacture mechanical devices.

The Ideal Barn Equipment Company, Horicon, Wis., has awarded contracts for its new factory, 56 x 120 ft., two stories and basement, of reinforced concrete and brick, to be ready June 15. It will manufacture steel and wood stanchions, tanks, litter carriers, etc. F. H. Bogda is general manager.

The Eagle River Concrete & Construction Company, Eagle River, Wis., will install considerable new machinery and molding equipment for the manufacture of cement and concrete products.

The Van Brunt Mfg. Company, Horicon, Wis., manufacturer of agricultural implements, has increased its capital stock from \$125,000 to \$500,000. F. H. Claussen is president and general manager.

Doelger & Kirsten, 511-519 Cedar Street, Milwaukee, engineers and machinists, have awarded contracts for several shop additions and will remodel the present structure, the whole to cost about \$10,000. Some new equipment will be installed.

Westinghouse, Church, Kerr & Co., Inc., New York, have started work on the general contract for the erection of an addition to the division shops of the Great Northern Railway at Superior, Wis., to cost \$150,000. It will be 200 x 288 ft., 35 ft. high, of brick and steel, and will be used for locomotive repair work.

The Auto Body Works Company, Appleton, Wis., has been incorporated with a capital of \$5,000 to manufacture motor truck and truck bodies. The incorporators are Humphrey and Dudley Pierce and Gustave C. Seeger.

The Western Pattern Company and K. J. Jacobsen & Co.,

patternmakers, Racine, Wis., have been consolidated under the name of Western Pattern & Mfg. Company, which has been incorporated with \$10,000 capital by K. F. Jacobsen, Elmer Beck, Miller Petersen, Oscar Jacobsen and Anton Petersen. The force consists of 30 skilled workmen.

The Mukwonago Tile & Concrete Products Company, Mukwonago, Wis., will erect a new factory, 50 x 100 ft., one story and basement.

The Western Coil & Electrical Company, now operating at Chicago, will move its plant and offices to Racine, Wis., about May 1, and has been incorporated in Wisconsin with \$30,000 capital. The incorporators are William M. Lewis, James W. Gilson and James V. Rohan. A plant is now being remodeled and equipped for the company in Racine.

The Flinn-Olsen Freighting Company, Green Bay, Wis., has been incorporated with \$12,000 capital by Ole T. Olsen, Thomas E. Flinn and George R. Kyte to build and operate lake vessels.

The Elsen & Phillips Company, 110 South Second Street, LaCrosse, Wis., is awarding contracts for the erection of a two-story garage and machine-shop, 100 x 140 ft., costing \$30,000. O. J. Sorenson is architect.

The Kant Kick Spark Set Company, Elkhorn, Wis., has been organized by William H. Opitz and Hugh Squires to manufacture automobile appliances, devices, etc., designed especially for Ford cars. A plant will be equipped at once.

Lodi, Wis., adopted a bond issue of \$4,000, the proceeds to be used toward the removal of the plant of the Skidd Mfg. Company, Kenosha, Wis., manufacturer of pasteurizing machinery, to Lodi. Negotiations are now being concluded.

The Racine Motor Truck Company, Racine, Wis., has been incorporated with a capital stock of \$50,000 to manufacture and repair motor vehicles and deal in tools, fixtures, etc. The company is the outgrowth of the vehicle business of Piggins Brothers, Racine. Ira L. Miller, Los Angeles, Cal., is interested. Arrangements for the establishment of a plant are now being made.

The Simmons Company, Kenosha, Wis., manufacturer of steel bedsteads and springs, will build a new administration and engineering building costing \$125,000. It will be 75 x 125 ft., two stories and basement, of brick, steel and concrete. N. M. Dunning, 35 South Dearborn Street, Chicago, is the architect.

The Lawson Aircraft Company, Green Bay, Wis., has been incorporated with a capital stock of \$10,000. The incorporators are George W. Ellis, William Hoberg and John P. Jessen. An airplane manufacturing plant will be established.

The Badger Meter Mfg. Company, 261-265 Third Street, Milwaukee, maker of water meters and similar measuring devices, will increase its capacity 100 per cent by the erection of a new plant costing about \$75,000 complete, on a site to be selected within a few days. Plans are being prepared by E. C. Clauer, architect, for a brick, steel and concrete shop building, 78 x 180 ft. J. J. Leach is president and general manager.

The Cooley Mfg. Company, West Bend, Wis., has been incorporated with \$12,000 capital to manufacture boxes, etc. The incorporators are Herbert E. and Phillip Cooley and Edward J. Krieger.

The Standard Automatic Tool Company, Racine, Wis., has been organized with a capital stock of \$25,000 by Emil and Paulina Podlasek and Lawrence J. Berkeley.

The Player Specialties Company, 418 East Water Street, Milwaukee, has been organized by John G. Stenger, Frank J. Clark and James C. Arthur to manufacture automatic playing devices for pianos and organs, to be operated by electric motors.

The Althouse-Wheeler Company, Waupun, Wis., states that it needed more room and sold its jobbing line of pipe, pipe fittings and well goods to the Star Pointer Pump Company, Menasha, Wis. This had nothing to do with its manufacturing plant which will be continued with increased capacity.

Indianapolis

INDIANAPOLIS, IND., April 16, 1917.

The U. S. Fiber Box Company, Indianapolis, has increased its capital stock from \$50,000 to \$100,000.

The Wayne Oil Tank & Pump Company, Fort Wayne, Ind., will erect a factory addition.

Michigan City, Ind., will ask for bids April 24 for two electric motor-driven centrifugal pumps of 4500 gal. per min. capacity. Alexander Spychalski is city clerk.

The American Chain Company, Bridgeport, Conn., is making additions and repairs to its chain plant at Marion, Ind., with the view of putting it in operation.

The Kentucky Smoke Consumer Company, Evansville, Ind., has been incorporated with \$12,000 capital stock to manufacture smoke consumers. The directors are H. C. Kley-meyer, C. A. Erskine and A. A. Klein.

The Portage Brick Company, South Bend, Ind., has been incorporated with \$80,000 capital stock to manufacture brick, etc. The directors are H. M. Kauffman, G. A. Elliott and E. A. Morse.

The Bockstege Furniture Company, Evansville, Ind., has increased its capital stock from \$75,000 to \$150,000.

The Wemyss Furniture Company, Evansville, Ind., has been incorporated with \$100,000 capital stock to manufacture furniture. The directors are Daniel Wertz, William H. McCurdy, Robert R. Williams, Henry C. Murphy and C. H. Battin.

The Lindley Box & Paper Company, Marion, Ind., has increased its capital stock from \$75,000 to \$100,000.

Cincinnati

CINCINNATI, OHIO, April 16, 1917.

The domestic call for machine tools is good, but there has not yet been any noticeable increase since the declaration of war. Many manufacturers, however, are quietly preparing their plants to take care of different kinds of Government work which they anticipate will be placed at an early date. It is generally known that several firms are now about ready to make deliveries on special machine tools for finishing anti-aircraft guns, that were ordered some time ago. The daily press reports that two firms in Dayton, Ohio, have received large munitions contracts from the Government, which rumors these companies will neither affirm nor deny.

Makers of screw machine products are working at full capacity, and could take on more business if the parts could be finished on time. In spite of the high cost of boiler and tank plates, boiler and tank manufacturers are very busy. Wood-working machinery is in good demand. The local and nearby manufacturers of motor trucks are operating their plants on full time, and some of them are having trouble in making shipments within contract time.

The Corcoran-Victor Company, Cincinnati, maker of automobile lamps and other specialties, reports the receipt of orders lately that will keep its plant operating at full capacity for the next 12 months. Tentative plans are under way for an addition to its factory.

The Pfau Mfg. Company, Cincinnati, has let contract for an addition to its plant in Norwood, a suburb, that will be used for making sanitary plumbing goods.

The Lunkenheimer Company, Cincinnati, maker of engineering specialties, has let contract for an addition to its plant that will be used principally for storage purposes.

The Edwards Mfg. Company, Cincinnati, manufacturer of sheet-metal and other specialties, has acquired an additional site adjoining its plant on Eggleston Avenue, and will probably enlarge its factory at a later date.

The Miami Tool & Die Company, Dayton, Ohio, has let contract to the Structural Engineering Company, Dayton, for erecting a factory building that will contain 12,000 sq. ft. of floor surface. The company expects to move into its new plant before July 1.

The Dayton Ice Mfg. & Cold Storage Company, Dayton, Ohio, has had plans prepared for an addition to its plant.

The Sheffield Machine & Tool Company, Dayton, Ohio, Charles E. Watterson, president, has had plans prepared for a factory building at Monument Avenue and Foundry Street, which will have over 20,000 sq. ft. of floor space.

The Dayton Airplane Company, Dayton, Ohio, has been incorporated with \$500,000 capital stock by E. A. Deeds, H. E. Talbott, Charles F. Kettering, Orville Wright and others. It is reported, but not yet officially confirmed, that a large aeroplane manufacturing plant will be constructed.

The Smith Gas Engineering Company, Lexington, Ohio, is having a large plant built at Moraine City, a Dayton, Ohio, suburb, and as soon as completed, its headquarters will be transferred to the new plant. The Lexington factory will continue in operation as a branch plant.

The Dayton Research Laboratories Company, Dayton, Ohio, E. A. Deeds, president, has commenced construction on a new plant at Moraine City, a suburb, that will be 50 x 200 ft., four stories, of reinforced concrete.

On April 11 fire almost completely destroyed the plant of the Buffalo-Springfield Road Roller Company, Springfield, Ohio, entailing a loss of about \$400,000. Rebuilding plans are already under way.

The Watts-Dunn Air Pump Company, Springfield, Ohio, has been incorporated with \$10,000 capital stock by A. K. Smith and others. Nothing is yet known as to manufacturing plans.

The Elwood Myers Company, Springfield, Ohio, will soon commence work on the construction of an addition to its plant, recently mentioned, that will be 60 x 100 ft., four stories. It will house the electric sign manufacturing department. Practically all needed equipment has been purchased.

The Chaney Mfg. Company, Springfield, Ohio, maker of advertising novelties, will make a brick addition to its plant, 30 x 60 ft., two stories.

The Meteor Motor Car Company, Piqua, Ohio, has acquired the plant of the Klanke Furniture Company, and will fit it up for the manufacture of wooden and steel bodies for motor-driven ambulances and hearses.

The Peters & Heron Dash Company, Columbus, Ohio, manufacturer of automobile accessories, has begun work on a new addition to its plant, 60 x 100 ft., of brick construction.

Birmingham

BIRMINGHAM, ALA., April 16, 1917.

Local boiler, engine and machinery builders are loaded with orders and the demand is for rush work without question of price. The mining field is a liberal purchaser of apparatus, both steam and electric. Machinery dealers are busy seeing that orders are executed as soon as is possible. Orders are coming in without solicitation.

The Merrill-Stevens Company, Jacksonville, Fla., engineer and contractor for boiler making, ship repairs, etc., is about to start the construction of four shipways each to provide for the construction of a 5000-ton vessel. Its present capacity allows for the construction of one 2000-ton boat. The steel for four 5000-ton steamers has been ordered, and the ship berths will be rushed to completion. It is estimated that an additional force of 1500 men will be required. A. D. Stevens is president.

The Sloss-Sheffield Company, Birmingham, has no special schedule of improvements for this year other than new apparatus to be installed in its ore and coal mines from time to time.

Birmingham, Ala., will expend \$500,000 in waterworks and lighting plant enlargement as soon as its bond issue is negotiated.

The Gadsden Car Works, Gadsden, Ala., will enlarge and increase its output.

The Oden-Elliott Lumber Company, Birmingham, has purchased 73,000 acres in Clay and adjoining counties which it will develop.

The Tennessee Cast Iron Pipe Company, Rockwood, Tenn., will build 70-ton cast-iron water and gas pipe works. John R. McWane, J. E. Smith, and others, are interested.

The Central South

LOUISVILLE, KY., April 16, 1917.

The trend of manufacturers in this district toward a discontinuance of steam-power equipment and its replacement with motors using central station service shows a notable increase. Increased cost of coal is one of the principal causes of the development. About the best delivery to be had on motors is 20 weeks from receipt of order.

The Louisville Industrial Foundation, Louisville, Ky., known as the Million Dollar Factory Fund, has appointed a special committee of manufacturers to develop a local malleable castings foundry. A preliminary investigation made by Tampton Aubuchon, general manager for the foundation, disclosed the fact that the tonnage of malleable castings would probably be doubled or trebled if such a foundry were established in Louisville. The committee is now negotiating with a number of malleable iron companies, with a view of establishing a branch plant in Louisville, and in the event that these negotiations are not successful, local capital will be employed to develop the industry.

The Henry Vogt Machine Company, Louisville, has commenced work on an addition to its forge shop of steel construction, 75 x 140 ft., to cost about \$6,500. The equipment will include 8 steam hammers, maximum 5000 lb. and minimum 1000 lb. It is hoped that operations will begin June 1, as the capacity of this addition has been sold.

The Newport Rolling Mills Company, Ninth and Lowell Streets, Newport, Ky., has awarded contract to D. Meinken, 2126 Western Avenue, Cincinnati, for a one-story machine shop, 50 x 240 ft. Albert Andrews is president.

The Louisville Woolen Mills, Louisville, plans the installation of 12 electric motors of from 5 to 20 hp., totaling 250 to 300 hp., for a 440-volt, three-phase, 60-cycle current.

The Hoke Company, Louisville, and Buechel, Ky., operating a quarry, contemplates equipping for electric drive and will require a motor-driven air compressor of good size and a motor.

The Hilton Collins Company, Louisville, is considering changing its wood-working factory from steam to electric drive and will be in the market for motors aggregating 100 hp.

The Louisville Cotton Mills, Louisville, is preparing to change its plant from steam to electric drive, and will install 130-hp. motors ranging from 7½ to 30 hp. An ultimate installation of 1500 hp. is planned.

The Louisville Car & Foundry Company, Louisville, Ky., has been incorporated with capital stock of \$10,900 by C. H. Charles and Henry Schimpeler.

The Salchli Ham Holder Company, Frankfort, Ky., has been incorporated with capital stock of \$5,000 by J. F. Salchli, Elza Ueltschi and others, to produce a patented article, which will be manufactured by contract for the present.

The Memphis Engineering & Supply Co., Memphis, Tenn., has been incorporated with a capital of \$20,000 by W. R. Nifong, R. C. Nifong, J. W. Marshall and J. W. Squier.

The Southern Machinery Exchange, Lexington, Ky., is asking for dealers' prices on a 35 to 40-hp. gasoline or kerosene engine in good condition.

The John G. Duncan Company, Knoxville, Tenn., is asking for dealers' prices on a second-hand 150-hp. return tubular boiler for 125-lb. working pressure.

St. Louis

ST. LOUIS, MO., April 16, 1917.

Only imperative buying of machine tools was reported in this market the past week, the disposition being to await further war developments. This does not denote hesitancy from the standpoint of a recession of business. Manufacturers generally are operating to capacity, though the labor supply is inadequate.

The Manhattan Electric Supply Company has acquired a building at Fourteenth and Papin streets, St. Louis, which it will equip as a branch factory.

The Ferro Concrete Paint & Chemical Company, St. Louis, has been incorporated with a capital stock of \$100,000 by C. A. Moreno, E. G. Burkham and C. H. Witthoeft.

The Apex Mfg. Company, St. Louis, has been incorporated with a capital stock of \$14,000 by A. R. Chappell, P. S. Martin and L. E. Almon to manufacture automobile parts.

The Collapsible Crate Mfg. Company, Houston, Tex., will equip a plant at Joplin, Mo., requiring wood-working equipment.

The Modern Auto & Garage Company, Belleville, Ill., will erect and equip a garage and machine shop to cost complete about \$75,000.

The Commercial Acid Company, Texarkana, Ark., whose plant was burned recently, will rebuild and is in the market for about \$12,000 worth of machinery for the manufacture of acids used in explosives.

The Mayes County Gin Company, Locust Grove, Okla., is in the market for about \$6,000 worth of cotton ginnery equipment. S. D. Dowdy is in charge.

The Healdton Ice Light & Power Supply Company, Healdton, Okla., C. V. Miller, president and manager, is in the market for about \$16,000 worth of ice and electrical machinery.

The Wilson Refining Company, Wilson, Okla., is in the market for about \$20,000 worth of oil-refining equipment. W. B. Gill is in charge.

The McAlester Grain & Elevator Company, McAlester, Okla., is in the market for about \$15,000 worth of equipment. T. H. Hardeman or S. T. King may be addressed.

The Oklahoma Auto Parts Company, Enid, Okla., has been incorporated with a capital stock of \$150,000 by M. E. Darland and G. E. Darland.

The Fast-Oswalt Motor Company, Muskogee, Okla., has been incorporated with a capital stock of \$25,000 by Judson C. Fast, and others, and will equip a machine shop and garage.

The Algonquin Lumber Company, Meridian, Miss., E. D. Ward in charge, is in the market for about \$25,000 worth of machinery.

Monroe, La., has voted \$61,000 for the reconstruction of its electric generating plant. Specifications may be obtained from Walter G. Kirkpatrick, engineer, Jackson, Miss.

The De Ridder Foundry & Machine Company, De Ridder, La., J. W. Sanders, president and manager, will equip a plant for the repair and reconstruction of heavy sawmill machinery, locomotives, etc. It will also manufacture brass castings.

The Henderson Iron Works & Supply Company, Shreveport, La., will add a steel castings department.

The Wilson Lumber Company, Leesville, La., will equip a mill with a capacity of 200,000 ft. per day, to be in operation by November 1.

Crowley, La., is in the market for about \$4,500 of pumping equipment for its waterworks.

Texas

AUSTIN, TEX., April 14, 1917.

B. F. Bonner, vice-president and general manager of the Kirby Lumber Company, and associates, who recently purchased 86,000 acres of timber land in eastern Texas for about \$8,000,000, will organize a company and build a lumber mill near Orange. J. W. Reynolds, president of the Sabine Lumber Company, Houston, will be general manager.

The Economo Company, San Antonio, will manufacture a mechanical device to be attached to internal combustion engines. E. W. Moore is a stockholder.

The St. Louis, Brownsville & Mexico Railroad will install an electric light and power plant at Kingsville for supplying its shops and terminals. J. E. Anderson, Kingsville, is purchasing agent.

The Wichita Asphalt Paint & Varnish Company, Wichita Falls, has been incorporated with a capital stock of \$30,000, and will install a plant to manufacture paints and varnish. B. H. Williams is active in the development work.

The Hamlin Light, Power & Ice Company, Hamlin, has been incorporated with a capital stock of \$60,000 and will build an electric light and power plant and an ice factory. The stockholders are A. V. Wainwright, R. F. Price and F. A. Matthes.

The Universal Auto Lock Company, El Paso, will build a plant to manufacture a locking device for automobile steering wheels to cost about \$25,000. O. F. Coleman is a director.

The Handy Airtight Refrigerator Company, Fort Worth, has been incorporated with a capital stock of \$20,000 and contemplates building a plant to manufacture refrigerators. W. H. Moore is in charge.

The Sinclair Gulf Corporation, headed by H. F. Sinclair, 120 Broadway, New York, which recently took over the oil properties of E. F. Simms and associates in the Gulf coast fields for approximately \$25,000,000, will soon begin the construction of an oil refinery upon the ship channel near Houston. The proposed plant will cost approximately \$5,000,000.

Albert Brown, Brownsville, and associates will install an irrigation pumping plant near San Benito at a cost of \$65,000. The pump will deliver 100,000 gal. per min. and will be operated by an internal combustion engine.

The Pacific Coast

PORTLAND, ORE., April 10, 1917.

The early opening of the logging camps, most of which are adding new equipment for this season's work, and better freight deliveries have been prominent factors in recent business. These have been somewhat offset by the hesitancy of small machine buyers, owing to the international situation. Big orders have been more numerous, with the lumbering and ship-building interests the heaviest buyers. Repair shop and garage business has been rather slow, houses planning this type of work apparently waiting further developments in the war before going ahead with their plans. Higher prices are expected here very shortly and small advances on several lines have been announced this last week. Local dealers in machinery and equipment refuse to make any prophecies as to the probable effect of the first war activities on business in the Northwest. The necessity for rushed activities in ship-building will, it is believed, bring an even more active demand for machinery of all kinds. A number of sawmills are planning to reopen their plants to supply lumber for the wooden shipbuilding industry, which promises to be remarkably prosperous.

While the shortage of cars on the lines serving the Pacific Northwest is still acute, railway officials maintain that lack of equipment is not so severe as it has been recently. At present the lines in Oregon and Washington are short about 6000 cars, compared with several times that number when the shortage was more pronounced. The moderation of weather in eastern sections will probably permit the moving of a large amount of freight.

The farmers in Eastern Washington and Oregon are planning on unusually large crops, and the demand for farming machinery and equipment of every kind has been unusually

large. Splendid crops and high prices of last year have made money available for improvements to farm equipment, and this demand is being felt in Northwest cities. According to reports new equipment, rather than second-hand, is called for.

At a recent meeting of shipbuilders and lumbermen in Portland, it was ascertained that Oregon has eleven wooden shipbuilding plants in operation, six of which are in Portland. If necessary, facilities could be increased to enable these plants to construct at one time a fleet of 40 vessels of 3000 tons capacity each. In Oregon 60 sawmills with cut of 16,000,000 ft. every 24 hr. are equipped to furnish shipbuilding material.

The Chicago, Milwaukee & St. Paul Railway Company has announced its intentions of expending \$6,000,000 for electrifying its line between Othello and Seattle. The work provides for eight sub-stations costing \$175,000 each. G. F. Wilder, Seattle, is Western purchasing agent and will have charge of purchases.

The Washington Magnesite Company, Chewelah, Wash., has secured a 20-acre site near that city, on which it will erect a magnesite manufacturing plant.

The South Bend Shipbuilding Company, Seattle, has been incorporated by C. E. Vilas, Ferguson Hansen, and E. S. Goodwin.

The Equitable Co-operative Milling Company, Helena, Mont., has been incorporated for \$1,000,000 by John C. Dooley, James E. Waite, and E. J. M. Williams. It will establish a milling plant in Helena.

The Todd Shipbuilding Company, Tacoma, Wash., has awarded contracts for the construction of its plant in Tacoma. The initial expenditure will amount to \$125,000.

The Railway Equipment Company, Portland, Ore., has secured a site in Linnton, Ore., and plans to immediately remove its plant to that city.

The M. C. Box Company, Marcus, Wash., has been incorporated with capital stock of \$10,000 by Ernest Morin, Samuel Carlin and Frank Parker, and will construct a box factory.

The Ames Shipbuilding Company, Seattle, now holds contracts for 12 steel ships, contracts for which provide that ships shall be ready for delivery by the end of 1918. It will immediately construct a 10,000-ton wooden floating dry dock, and will make extensions to its plant to permit of general ship repair work.

The Olympic Portland Cement Company's plant, Bellingham, Wash., has been reopened after an idleness of almost a year. It has a capacity of 2000 bbl. daily.

The Great Northern Railway Company has received permits for erection of five structures in Great Falls, which will be part of the car and engine shop extensions planned, and will cost \$200,000. The machine shop will be 200 x 280 ft., to cost \$155,500. The other structures include car repair shop, extension to the machine shed, and a steam boiler plant. The work is to be completed by Oct. 1.

The Puget Sound Machinery Depot has completed plans for construction of a one-story, crane shed, 32 x 110 ft., and a machine-shop addition to its factory in Seattle, Wash.

A company headed by Louis Henrick is to remodel the Rainer plant of the Seattle Brewing & Malting Company, Seattle, Wash., and install machinery for manufacturing denatured alcohol. One entirely new unit will be built and equipped. The cost will be \$250,000.

A municipal hydroelectric plant is planned for Seattle, Wash., at a cost of \$3,000,000.

The Seattle Machine Works, Seattle, Wash., has increased its capital stock to \$100,000.

The Cavotto Shipbuilding Company, Seattle, Wash., has been incorporated and work on its new shops will be begun shortly.

The Western Shipbuilding Company, Tacoma, Wash., has taken a contract to construct a 360-ft. auxiliary schooner at Gig Harbor, and will install additional machinery in this yard.

The Skinner & Eddy Corporation, Seattle, Wash., will install new machinery as a result of receiving a contract for a 9500-ton steel oil tanker.

The Everett Shipbuilding Company, Everett, Wash., is being organized with a capital of \$100,000. Wooden vessels will be built.

The Certain-Teed Products Company, formerly the General Roofing Mfg. Company, is having plans prepared in St. Louis for the extension of its Richmond, Cal., plant. Two new lines of manufacturing have been added by this corporation.

The Western Pipe & Steel Works, Richmond, Cal., has just completed three additional buildings which will almost double the capacity of the plant.

Canada

TORONTO, ONT., April 16, 1917.

The Dominion Steel Foundry Company, Ltd., and the Hamilton Steel Wheel Company, Ltd., both of Hamilton, Ont., are to be amalgamated through an exchange of shares as the Dominion Foundries & Steel, Ltd. The activity of both companies has so increased that their directors decided that joint production would be carried on more economically. The officers of the new company will be C. W. Sherman, president; W. J. Verity, Robert Hobson, J. J. Harty, Paul J. Myler, W. E. Phin, S. A. Crone, Frank A. Sherman and A. G. Wright, directors.

The Standard Underground Cable Company of Canada, Ltd., Hamilton, Ont., is building an addition to its plant, one story, 120 x 125 ft., of brick and concrete, to cost \$50,000, for the wire drawing department. In addition to housing the former equipment, additional machinery will be installed, capable of drawing wire from No. 40 B. and S. gage, to the largest size of trolley wire; also machines for grooving trolley wire and for rolling flats and squares, such as are used in the manufacture of magnet wires. There will also be two new bright-annealing furnaces. All of the machinery in the new plant will be electrically operated by three-phase, 550-volt, 25-cycle alternating current motors. The architects are Prack & Perrine, Hamilton.

Tupper & Steele, 669 Third Avenue West, Vancouver, B. C., are in the market for an engine lathe of about 20-in. swing.

Sudbury, Ont., will spend \$2,500 on additions to its sewage pumping station.

W. G. Murray, Dominion Savings Building, London, Ont., is taking bids for a foundry at London, Ont., for Beatty Brothers, to cost \$35,000.

Barnett & McQueen, Port Arthur, Ont., have been awarded contract for the erection of an elevator for James Richardson & Sons, Ltd., Port Arthur, to cost \$700,000.

Scythes & Co., 22 Church Street, Toronto, will build a two-story brick factory for the manufacture of cordage, to cost \$20,000.

R. Wescott & Co., Woolworth Building, Windsor, Ont., have been awarded contract for the erection of one-story concrete and brick machine shop for the Windsor Tool & Machine Company, Windsor.

Bids are being received by the town clerk, F. J. Pilkington, Yorkton, Sask., until April 30, for an oil engine to cost \$20,000.

The National Abrasive Company, Amesbury, Mass., manufacturer of abrasive material for grinding and polishing, has decided to locate in Hamilton, Ont., and has bought an acre and a half of land on Bigger Avenue, near Lottridge Street, in that city. It will start erecting a factory immediately and expects to start operations in 90 days, and will employ about 75 men. The equipment and material is being ordered through the Ritchey Supply Company, Toronto, its selling agents in Canada. Nathan C. Harrison, treasurer of the Harrison Supply Company, is also president of the National Abrasive Company, and he has connected with him, J. T. Johnston, who is looking after the erecting and equipping of the Hamilton factory.

MacKinnon, Holmes & Co., Ltd., structural and steel plate worker, has already completely rebuilt its plant which was destroyed by fire with a loss of over \$38,000, and work is now proceeding as usual. George D. MacKinnon is vice-president and general manager. F. C. Johnston has succeeded A. R. Holmes as secretary and treasurer.

Strong & Dower, Calgary, Alberta, will build four elevators in the province of Alberta this year to have a capacity of 30,000 bu. each.

J. D. McArthur, contractor, Winnipeg, Man., will commence soon the erection of pulp and paper plants to cost \$250,000.

Akerberg, Thomson & Co., Ltd., Prince Rupert, B. C., has been incorporated with a capital stock of \$45,000 to operate foundries, steel works, etc.

The Canadian Government has taken an option on the Benson property at Boundry Bay, near Ladner, B. C., with a view to establishing an aviation plant there.

Plans are being prepared by Gilbert Jacques for a service building for the Studebaker Corporation, at Windsor, Ont., of brick, steel and concrete, three stories, 50 x 80 ft., to cost \$30,000.

The Canadian Lamp & Stamping Company, Windsor, Ont., is having plans prepared by Gilbert Jacques, for a one-story addition to its plant, of brick and steel, 60 x 210 ft., to cost \$25,000.

Bids are being received by John Youngston, manager of the Goderich Dry Dock & Shipbuilding Company, Box 171, Goderich, Ont., for a plate shed in connection with the construction of a dry dock and shipbuilding yard there.

The Alaska Standard Copper Company, Landlock, Alaska, will shortly install a compressor plant and will also be in the market for other machinery and equipment.

J. J. Kovarick, manager of the Robin Hood Mills at Moose Jaw, Sask., announces that the company will spend \$100,000 on additions to its plant this year, including an addition to its flour mill to increase the capacity of the plant from 2000 to 3000 bbl. per day and the capacity of the oat mill from 500 to 800 bbl. per day. The improvements will be made and the machinery installed by Sept. 1.

The Hesco Electric Mfg. Company, 210 Adelaide Street West, Toronto, is in the market for several power stamping machines, automatic tapping machines, etc.

Mr. Johnson, 536 Dundas Street, Toronto, is in the market for a 30-in. pedestal bank saw.

The Huot Rifle Automatic Attachment Company, Ltd., Montreal, has been incorporated with a capital stock of \$500,000 by Joseph A. Huot, Stanislas E. Desmarais and Joseph A. Belair, all of Richmond, Que., and others.

The Omega Machinery Company, Ltd., St. Hyacinthe, Que., has been incorporated with a capital stock of \$45,000, by Ovide Brouillard and Etienne H. Solis, both of Montreal; Emile Ponton, St. Hyacinthe, Que., and others, to manufacture windmills, pumps, etc.

The Quebec Munitions, Ltd., Montreal, has been incorporated with a capital stock of \$190,000 by A. Picard, G. Parent, J. P. Cantin, and others.

The Mechanical Salesman, Ltd., Vancouver, B. C., has been incorporated with a capital stock of \$50,000 by Clarence O. A. Travis, Govan, Sask.; Frank L. Smith, Charles W. St. John, and others, of Vancouver, to manufacture automatic vending machines.

The Union Cement Company, Owen Sound, Ont., will double the capacity of its plant this year, and bring the output up to 2000 bbl. per day. It will increase its capital from \$200,000 to \$1,000,000. The company will change to electric power from steam. It is estimated that the total cost will be \$60,000.

Government Purchases

WASHINGTON, D. C., April 16, 1917.

The Bureau of Yards and Docks, Navy Department, Washington, will receive proposals until 11 a. m., April 23, under specification 2349, for two motor-driven hydraulic pumps and two accumulators for Norfolk and one motor-driven pump and accumulator for Philadelphia.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until May 8, schedule 337, for one air compressor and motor and air receiver for San Diego, Cal.

Owing to the national emergency it will be necessary to receive bids as soon as possible and the dates of opening specified for various schedules are the very latest at which the bids can be opened. All bidders are requested to cooperate in preparing their bids as soon as possible. The period in which schedules will be in print will be reduced somewhat shorter than heretofore. Visitors to the Navy Department are restricted and it is requested that matters be handled by correspondence as far as possible in order to conserve the time of officials.

The following bids were received by the chief of the Bureau of Yards and Docks, Navy Department, Washington, April 9 for furnishing a shipbuilding crane at the Charleston Navy Yard.

Item 1, work, complete, on foundations furnished by the government; 2, do. with bidder's modifications; 3, price for crane f. o. b. works; 4, price per working day of eight hr. each for services of engineer to superintend erecting of the crane by the Government if awarded under item 3.

The McMyler-Interstate Company, item 1, \$25,715, 175 days; 3, \$22,140, 150 days; 4, \$12.

The following bids were received by the chief of the Bureau of Yards and Docks, Navy Department, Washington, April 9 for two locomotive gib cranes of 50 gross tons capacity for the navy yards at Norfolk and Philadelphia.

Item 1, electric crane delivered at Norfolk; 2, similar crane for Philadelphia.

The Penn Bridge Company, Washington, item 1, \$102,340; 2, \$101,340; deduct \$2,150 from each crane if awarded both.

NEW TRADE PUBLICATIONS

Automatic Polishing and Buffing Machines.—Chase Turbine Mfg. Company, Orange, Mass. Pamphlet. Describes an automatic polishing and buffing machine for polishing or buffing circular and cylindrical work, as well as face, surface and angular polishing or buffing, which adapts it for a great variety of work. One of the advantages claimed for the machine, which is built with either a vertical or horizontal head for holding the work, is that the rehandling necessary in the process of cutting, polishing and buffing where the operation is performed in three distinct steps is eliminated, the three wheels being mounted on the same spindle. Views of both types of machines and a condensed table of specifications are included. An illustrated description of this machine appeared in *THE IRON AGE*, March 1, 1917.

Air Compressors.—Sullivan Machinery Company, Peoples Gas Building, Chicago. Two bulletins. The first, No. 71-C, presents a brief statement of the advantages of air lift pumping for water and the handling of chemicals, acids, etc. The various systems of pumping are briefly described and the bulletin is illustrated with engravings of the compressors and other apparatus used, as well as plants in which the system has been installed. A number of diagrams of methods of installation and tables of useful information are included. The other bulletin, No. 75-B, deals with a straight line horizontal air compressor with a simple steam cylinder and two-stage air cylinders. The construction of the compressor is gone into in some detail, the text being supplemented by numerous engravings. Illustrations of installations of the compressor are presented and a general table of weights and dimensions is included.

Calendar.—National Tube Company, Frick Building, Pittsburgh. Preparedness calendar measuring 14 x 23 in. Illustrations are given of the many uses to which pipe can be put. These range from a large locomotive to beds made of hollow tubing. A poem describing the almost numberless uses to which pipe and tubing may be put appears in the center of the hanger with the illustrations surrounding it on three sides and a calendar for 1917 and the first six months of 1918 at the bottom.

Alloy for Steel Products.—Pittsburgh Iron & Steel Foundries Company, Midland, Pa. Booklet. Devoted to Adamite, a high-carbon alloy of chromium and nickel used in the manufacture of rolls and other steel products. The latter includes dies of all kinds, brakeshoes, shearing machines, pinions, carwheels, etc. Numerous illustrations of steel products in which the alloy was used and gave long service are presented, including one of a pair of 14-in. continuous billet mill rolls which produced over 120,000 tons of steel without having to be turned.

Manufacturing Lathe.—Himoff Machine Company, 45 Mills Street, Long Island City, N. Y. Circular. Refers to a 21-in. heavy-duty manufacturing lathe, which was illustrated in *THE IRON AGE*, Nov. 9, 1916. A description of the lathe, which was first brought out with the single idea of turning shells rapidly and was later modified for heavy-duty plain, taper and form turning, is presented, the descriptive matter being supplemented by engravings of the lathe and a table of specifications.

Pressed Steel Platforms for Elevating Shop Trucks.—McMyler Interstate Company, Bedford, Ohio. Bulletin No. 37. Devoted to a line of pressed steel platforms for use with hand and power elevating shop trucks. The advantages claimed for these platforms as compared with the wooden ones generally employed are strength, compactness, suitability for stacking and absence of fire risk. A number of views of the platforms in use are presented together with a half-tone engraving showing how they can be nested for storage. A table of the standard sizes of platforms is included.

Blast Gate.—W. S. Rockwell Company, 50 Church Street, New York City. Circular. Mentions a blast gate designed for use with low-pressure air in connection with oil, gas and coke fired furnaces, blacksmith forges, blast pipes, etc. Engravings of the gate, which is tapped for standard threaded pipe in sizes ranging from 2 to 12 in. in diameter, are presented. Among the advantages claimed for the gate are that it is fully inclosed, has a fully machined slide and runway and is air tight.

Duplex Pumps.—Dean Bros. Steam Pump Works, Indianapolis, Ind. Circular No. 104. Points out the advantages of this company's duplex pump as compared with the type generally used. An arrangement of parallel columns is employed to show the contrast between the two types of pump

and in a number of cases engravings are employed to supplement the text presentation of the features. Special emphasis is laid upon the duplex valve gear, which is described at some length. A drawing of the pump is presented with the various advantages indicated by inscriptions and leaders running to the particular parts mentioned.

Mud Gun.—Edgar E. Brosius, Benedum-Trees Building, Pittsburgh. Bulletin No. 12. Covers the use of an automatic mud gun for plugging the tap holes of blast furnaces without reducing the blast pressure to any appreciable extent. A description of the gun is presented and the advantages claimed for its use, such as increased iron production, decreased coke and clay consumption, reduction in the amount of labor required and a lower maintenance cost, are briefly touched upon. A number of views of the gun in use at blast furnaces are included.

Motor Trucks.—Packard Motor Car Company, Detroit. Motor Truck Bulletin No. 35. Concerned with the records made by two trucks in the economical handling of steel castings over hilly roads. Tables of cost data are included and a number of views of the trucks in use are presented. A brief mention is made of a new type of truck equipped with a four-speed transmission, thermostat water cooling control and a worm drive.

Rotary Pumps.—Gould's Mfg. Company, Seneca Falls, N. Y. Bulletin No. 113. Relates to a line of rotary pumps for all classes of service, among which are fire protection, pumping chemicals and other liquids, circulating cooling water for gas engines and supplying cutting compound and oil to metal-working machines. A brief description of the general construction of the pumps is presented, followed by detailed specifications and speed and capacity tables of the different styles that can be supplied. Among the pumps illustrated is one for pumping oil and lubricating compound to metal-working machinery, which was illustrated in *THE IRON AGE*, Nov. 16, 1916.

Hand Traveling Overhead Cranes.—Brown Hoisting Machinery Company, Cleveland. Catalog P-1917. Treats of a line of overhead hand traveling cranes consisting of a single I-beam supported at each end on a patented cast-steel truck frame, the lower flange of the beam serving as a track for the trolley with the load. This arrangement, it is emphasized, enables the crane to be used where the headroom is exceedingly limited. A number of engravings of the various types of cranes are presented, together with views of plants in which they have been installed. A number of clearance and specification diagrams and tables are included.

Die Castings.—H. H. Franklin Mfg. Company, Syracuse, N. Y. Pamphlet. Deals with the production of parts for machines by the die casting process. These include bearings for automobile and gas engines, printing machinery, cream separators, oil pumps, etc., small gears for computing machines, casings of oil and air pumps for automobiles and the framework of various instruments. A brief historical account of the development of the process is given, together with a short description of the dies and metals employed. A number of engravings showing the great variety of parts produced in this way are included.

Deoxidized Ferrous Metals.—Edward H. Schwartz, 435 Marquette Building, Chicago. Circular. Pertains to a line of deoxidized ferrous metals produced in a cupola or a reverberatory melting and refining furnace equipped with a special burner. The metals include alloy, carbon, high-carbon annealed and semi-steels, malleable and grey irons, and a nickel-iron alloy designed as a substitute for bronze. Brief descriptions of the various metals and the uses to which they may be put are presented.

Gage Standards.—Schuchardt & Schutte, 90 West Street, New York City. Pamphlet. Shows the application of a set of standard steel blocks or units that are adaptable to combinations of 0.0001 in., the total error of a combination of four or five not exceeding 0.00004 in. The construction, manufacture and use of these standards are described and a number of engravings of the various combinations that can be supplied are presented with lists of the different units in each. Mention is made of a line of holders and measuring jaws for the standards and a precision measuring and screw testing microscope.

Drop Presses.—Standard Machinery Company, Elmwood Avenue, Auburn, R. I. Catalog. Contains illustrations of an extensive line of plain and automatic drop presses for use in metal manufacturing where brass, steel, iron and all of the precious metals are employed, as well as for hot and cold forgings and for the shaping of cast steel and cast malleable iron parts. Brief general descriptions of the two types of presses are given before the engravings. The arrangements of foundations for the presses are illustrated and briefly described. Dimension tables of the presses are included, and mention is made of some of the other lines of the company, including trimming presses and rolling mills.

Judicial Decisions

ABSTRACTED BY A. L. STREET

INDIANA FACTORY ACT APPLIED.—In affirming judgment against a manufacturing company for fatal injuries sustained by an employee through coming in contact with a revolving coupling on a lineshaft in defendant's factory, while installing a telephone wire 10 or 12 ft. above the floor, the Indiana Appellate Court holds that although the Indiana factory act which requires factory owners to guard dangerous machinery was not intended to place unreasonable burdens on the employer nor to create liability for omission to safeguard workmen against every possible danger, the defendant may have been found to have been negligent in this case in directing decedent to work in close proximity to the unguarded appliance which caused his death. (*Coughlin vs. Indiana Mfg. Company*, 115 *Northeastern Reporter*, 260.)

ILLINOIS COMPENSATION ACT APPLIED.—An employee injured while waiting for his pay envelope in a room in a factory where machinery was in operation was engaged in such hazardous occupation as brings him under the provisions of the Illinois workmen's compensation act, although the room in which his active employment was carried on contained no dangerous appliances. (*Illinois Supreme Court, Pekin Cooperage Company vs. Industrial Board of Illinois*, 115 *Northeastern Reporter*, 128.)

VALIDITY OF MUNICIPAL LICENSE REGULATIONS.—Under the laws of Missouri, the city of St. Louis is empowered to impose a license tax on merchants for the privilege of buying and selling merchandise, to secure distribution of municipal expenses. Under such a regulation, distribution of goods at cost by a parent corporation to subsidiary corporations outside the State for retail sale may be regarded as "sales," for the purpose of imposing the privilege tax. The requirement of the Missouri statutes that merchants shall report "amount" of goods on hand, as a basis for assessing license taxes, refers to the value of such goods. (*Missouri Supreme Court, Simmons Hardware Company vs. City of St. Louis*, 192 *Southwestern Reporter*, 394.)

ADMISSIONS OF CORPORATE OFFICERS.—In a suit to recover the price agreed to be paid for mechanical equipment installed in connection with a power plant, in which case the defendant corporation claimed an offset on account of asserted failure of the equipment to come up to warranty under which it was sold, the plaintiff seller was entitled to show that defendant's manager had told a third person that the outfit was giving satisfaction and had increased the boiler capacity of the defendant's plant. (*Mississippi Supreme Court, McClave-Brooks Company vs. Belzoni Oil Works*, 74 *Southern Reporter*, 332.)

CARRIER'S LIABILITY.—Although a railroad company ceases to be under the strict liability of a common carrier and becomes liable merely as warehouseman, after the consignee of a shipment has failed to accept delivery, the company is still under a duty to hold the shipment at the destination for a reasonable time, and is liable for loss of the freight in transit under unauthorized reshipment. (*West Virginia Supreme Court of Appeals, Belknap vs. Baltimore & Ohio Railroad*, 91 *Southeastern Reporter*, 656.)

VALIDITY OF ORAL AGREEMENT.—A railroad company which had contracted to buy certain steel rails and angle bars from a rolling-mill company, under a valid written contract calling for delivery at a stated time, was precluded from rejecting delivery because not made within that time where the buying railroad company's representative had orally agreed to the delay, although the oral agreement may have been legally invalid because not in writing; it appearing that but for such verbal understanding the rolling-mill company would have made timely delivery. (*Wisconsin Supreme Court, Hirsch Rolling Mill Company vs. Milwaukee & Fox River Valley Railway Co.*, 161 *Northwestern Reporter*, 741.)

INTERSTATE FREIGHT CHARGES.—The shipper of goods in interstate commerce is liable for all lawful freight charges thereon, on the consignee failing to pay. Un-

der the interstate commerce act, a shipper cannot evade this liability on the ground that he has long been a patron of the railroad company and had a special understanding and custom in his dealings with the company whereby the carrier was to be the agent of the consignee as to all shipments delivered to the railroad company, and that it was mutually understood that he should be liable for freight charges only upon condition that he should be promptly notified of the consignee's refusal to accept the shipment or pay the charges. All special arrangements, agreements, customs, and understandings between individual shippers and interstate railroads, not open to all similar shippers on equal terms, and not filed with and sanctioned by the Interstate Commerce Commission, are void. (*Kansas Supreme Court, Atchison, Topeka & Santa Fé Railway Company vs. F. H. Stannard & Co.*, 162 *Pacific Reporter*, 1176.)

POWERS OF COMPANY PRESIDENTS.—When the president of a business corporation is intrusted with the general management of the company's affairs, contracts made by him with outsiders relating to business within the scope of the corporate operations are binding on the corporation, notwithstanding any secret limitations imposed upon his authority but not known to persons dealing with him on the strength of his apparent authority. (*New York Supreme Court, Appellate Division, Aetna Explosives Company vs. Bassick*, 163 *New York Supplement*, 917.)

MISSOURI EMPLOYMENT LAWS.—A Missouri statute provides that on an employee of any corporation doing business in the State quitting or being discharged, the superintendent or manager of the company shall on request give the employee a service letter, stating the character of work done by the employee, the reason for his quitting, etc. Held, that this law is not unconstitutional as being unjustly discriminatory against corporations, and that it is a valid exercise of the State's police power. The provision applies to foreign corporations doing business in the State, as well as to domestic companies. An agreement between employers in a given line of business to give no employment to persons leaving the service of any one of the employers within two years is an actionable wrong against an employee who is refused work on account of such agreement. (*Missouri Supreme Court, Cheek vs. Prudential Insurance Company*, 192 *Southwestern Reporter*, 387.)

The annual report of the Citizens' Association of Manitowoc, Wis., and its successor, the Chamber of Commerce, shows that industries which were given financial assistance to locate there are more than complying with their obligations. The Wisconsin Aluminum Foundry Company, which agreed to disburse \$350,000 in wages in a period of six years, has paid out \$204,000 in less than half that time. The Invincible Metal Furniture Company, which agreed to spend \$60,000 in wages before Sept. 21, 1917, has already disbursed \$66,000.

At the meeting of the Brooklyn Engineers Club, Brooklyn, N. Y., April 26, C. E. Drayer, secretary of the Cleveland Engineering Society, and of the Committee on Engineering Co-operation, will deliver an address on "Co-operation Between Local Engineering Societies and the Newspapers to Promote Intelligent Public Opinion." At the meeting on May 3, Joseph A. Steinmetz of Philadelphia, president of the Aero Club of Pennsylvania, will deliver an address on "Aerial Warfare and Some Devices, Terrestrial and Submarine."

The first receipts of iron ore at the port of Escanaba, Mich., arrived April 9 from Iron Mountain, Mich. The shipment consisted of a train of 28 cars, aggregating 1400 tons, on the Chicago, Milwaukee & St. Paul. The steamer W. L. King, now at Escanaba, is being made ready for the opening of navigation and probably will be the first ore carrier to leave Escanaba this season.

The Metals Production Equipment Company has removed its offices from 105 West Fortieth Street to the City Investing Building, 165 Broadway, New York.

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